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# The Ethics of Organ Donation and Its Relationship to Brain Death

by

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At this writing, approximately 62,000 people are waiting for organ transplants, but many will die before the transplants take place.<sup>1</sup> Ads, billboards, churches, civic groups, etc., appeal to the American public to contemplate giving what some have termed the "gift of life." It is argued that because of the great shortage of organs, and the wonderful benefits for those who receive organs, our society must be encouraged in a variety of ways to donate in order to increase the number of available organs. The phrase "gift of life" was carefully designed as a slogan which immediately denotes a double message: much good derives from organ transplantation and you will be considered a good, generous person if you sign up to become a donor.<sup>2</sup> We've all been exposed to wonderful, heart-warming stories of people who have been given a second chance at life with a new organ or organs. Yet there are some medical and ethical considerations a person should be aware of before signing on the dotted line.

There are times when the morality of freely donated tissue or organs is not in question. Someone living can donate bone marrow, lobes of the liver or lung, and any one of a paired organ such as one of two kidneys, without necessarily adversely affecting the life of the donor. After death, many tissues are also useable, such as skin, bones, corneas, veins, heart valves and connective tissue. This paper will not include the above mentioned types of transplantations.

This paper will address the donation of singular organs vital to the existence of a person, conditions to be met in diagnosing the death of a donor based on neurological criteria, and evidence of uncertainty that

surrounds this diagnosis. Uncertainty about the death of the donor is at the very core of this ethical dilemma.

Public awareness programs concentrate on the person waiting for the transplant and tend to overlook the fact that the dying donor is also a person whose intrinsic worth must be respected. As decisions about his/her life and death are being made, the morality of each action to be taken must be weighed.

The primary ethical consideration, then, is assurance that death has truly taken place before removal of an unpaired vital organ. If the donor is alive when his beating heart is excised, he won't be able to sustain life after its removal. "Thou shall not kill" is one of the commandments given to us by God. For more than two millennia, this has also been the foundation of medical ethics. Intentional killing of an innocent person is of its very nature immoral. Nothing can turn an act that is intrinsically wrong into one that is good even if a good, the saving of a human life, results from the killing.

### **New Definition of Death**

But how do we determine whether a person is dead or not? Before the dawn of the technological age, the answer to the question was relatively simple — irreversible failure of cardiopulmonary function. Since the advent of the technological age, a new way to define death has come into practice. The new definition relies on brain-related criteria determined to be irreversible and is commonly known as "brain death."

How did we arrive at this new definition of death? Two entities came into play around the same time: technological advances such as ventilators, dialysis machines and powerful medicines were introduced that have the ability to save and/or extend lives and meanwhile discovery of successful organ transplant techniques were taking place. With the new technology, comatose patients were able to survive for extended periods of time. "The advent of transplantation surgery provided a strong clinical motivation to define death as loss of brain function since the success of it depends on the use of viable organs uncompromised by circulatory failure."<sup>3</sup> A review of the literature clearly shows that organ donation and the diagnosis of "brain death" are so closely intertwined that it becomes difficult to discuss one without the other.

Before the arrival of the diagnosis of "brain death," the first attempts at transplanting vital organs were not very successful because organs could only be taken from people whose hearts had stopped. Vital organs deteriorate quickly without blood circulation so the success of the transplant is related to the freshness of the organ. According to Porzio, "It is safe to say that the transformation in the approach within the medical profession



(to a new definition of death) has been triggered and propelled by organ transplants."<sup>4</sup>

Eminent authorities began to question whether declaring death using neurological criteria might not be in order. In 1968 an ad hoc Committee of the Harvard Medical School met to discuss the issue. Their seminal report, "A Definition of Irreversible Coma" proposed defining irreversible coma as a new definition of death. The Committee drafted a set of criteria that physicians could use to establish a diagnosis of death. Included in the recommended testing was an EEG showing a flat-line result (to be repeated at least 24 hours later). Absence of brain stem and spinal reflexes were to be noted. This set of criteria came to be known as the "Harvard Criteria." When the Committee's report was published in *JAMA*, two revealing reasons for the proposal of this new definition were cited: (1) improved methods of resuscitation and support of individuals whose brains were damaged irreversibly, permitted their hearts to continue beating, at great emotional and financial cost, and (2) *it was difficult to obtain organs for transplant using the traditional definition of death.*" (emphasis added) The Harvard Committee further suggested that since "the courts had always accepted the definition of death adopted by the medical profession as valid for all legal purposes, legislation to redefine death was unnecessary as long as the medical community agreed upon brain-death criteria."<sup>5</sup> Since diagnosing "irreversible loss of brain function" in a person whose heart continues to beat is not a fact but a decision, the question of who is to decide was decided. As the old saying goes, you're dead when the doctor says you're dead.

People in the transplant field were obviously pleased to know of a new way to diagnose death. Thomas Starzle, M.D., who performed the first human liver transplant, had described the difficulties of transplanting a vital organ as quickly as possible after death diagnosed by cardiopulmonary standards remarked, "Acceptance of brain death in 1968 was a boon to transplantation."<sup>6</sup>

A new method of diagnosing death was a radical idea. Was brain death readily "accepted" in the beginning? Medical, legal, and philosophical journals were rife with discussions regarding the ethical, legal, and social aspects of the idea. Questions were posed, such as: What is death? How do you know when a person is really dead? Is there dead-dead and brain-dead? Is the determining fact of death to be clinical, biological, or legal? Slowly it became evident that "brain death" was the wave of the future, resistance quieted somewhat, and in some circles the principles became so universally accepted that they began to be taken for granted.

The Harvard Criteria appeared in 1968 with many other sets of criteria following, some less restrictive than others, some requiring an EEG, some

not. As early as 1978 more than thirty sets of criteria could be found<sup>7</sup> and a physician or institution was free to choose the criteria that best fit their needs.

State statutes were being enacted to recognize this new definition of death but they varied so from state to state that considerable confusion arose. A group of Medical Consultants on the Diagnosis of Death, facilitated by the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, convened in an attempt to bring about some unity to the inconsistencies abounding in "brain death" statutes. The Medical Consultants proposed a model statute, the Uniform Determination of Death Act (UDDA), and issued it to the President's Commission in 1981. The UDDA stated that "an individual who 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."<sup>8</sup> Their report included a set of criteria for determination of death and the brain-based criteria became known as the "whole brain standard."

### **Dissent Begins**

A small hole in the dike relating to the acceptance of "brain-related" criteria of death appeared in 1979 when Byrne et al. essentially referred to it as a kind of "legal fiction."<sup>9</sup> But "brain death" had become the prevailing belief in professional circles and Byrne et al.'s point of view was summarily dismissed; it did not fit into the intellectual climate of the time. As D. Alan Shewmon, M.D., put it, "no self-respecting academic neurologist would dare to entertain, let alone openly express, any objection to equating 'brain death' with death. In fact, dissenters were typically dismissed condescendingly as simpletons, religious zealots, or pro-life fanatics."<sup>10</sup>

In spite of enormous effort, the hoped-for establishment of one uniformly recognized set of criteria to determine the irreversible cessation of all functions of the brain seems to be an elusive goal. Theoretically, and in practice, one doctor could diagnose a patient as "brain dead" following one set of guidelines, and another doctor examining the same patient using a different set of guidelines might come to a different conclusion. These inconsistencies are troubling, especially considering the close alliance between brain death and organ donation. If the patient were a prospective organ donor, could that fact sway the diagnosis?

It's been over thirty years since the Harvard Ad Hoc Committee proposed the first set of criteria. Despite the advent of many new and improved sets, the American Academy of Neurology (AAN) acknowledged yet another "need for standardization of the neurologic examination criteria



for the clinical diagnosis of brain death" in 1995 and issued their own set of criteria. Relentless change in trying to standardize practice parameters for the diagnosis of brain death serves to further highlight the confusion and inconsistency surrounding the concept of "brain death."

It's important to keep in mind that there are conditions that can interfere with the clinical diagnosis of "brain death" that a physician must be aware of and rule out no matter which set of criteria he chooses to use. These conditions include "A) Severe facial trauma, B) Preexisting papillary abnormalities, C) Toxic levels of any sedative drugs, aminoglycosides, tricyclic antidepressants, anticholinergics, antiepileptic drugs, chemotherapeutic agents, or neuromuscular blocking agents, D) Sleep apnea or severe pulmonary disease resulting in chronic retention of CO<sub>2</sub>."<sup>11</sup> Even so, it has been acknowledged by several experts in the field that it can be extremely difficult to determine whether some of the conditions or drugs are present or not.

More leaks in the dike began to appear when the concept of the "whole brain standard" came under attack. A spate of articles began to appear in journals of philosophy and medical ethics in the 1990s arguing for and against the concept. Rather than the controversy over brain death settling down, it appeared to be heating up. Some argued that irreversible cessation of all higher brain functions would be sufficient to diagnose death because the human being as a *person* is dead. Robert Veatch, one of the more prominent proponents of this belief, stated in a 1993 article in *The Hasting Center Report* that the whole brain definition of death was collapsing and a new definition was called for. Peter Singer asserts that the medical concept of "brain death" was more or less a fabrication unsupported by medical facts, as Byrne et al. had alleged earlier. He, too, favors cessation of higher brain function as adequate for determining the diagnosis of "brain death."<sup>12</sup> Acceptance of higher brain function cessation as a satisfactory brain death definition opens the door for enormous ethical discussions since those in persistent vegetative states (PVS) and anencephalic infants could be considered as "brain dead" for organ donation purposes. However, it is impossible to address that debate here, as it is material enough for a separate paper.

The confusion regarding acceptable medical standards for diagnosing "brain death" came to light when Young et al. did a cross-sectional survey among a sample of 195 physicians and nurses likely to be involved in organ procurement for transplantation. The professionals were interviewed regarding their knowledge, personal concepts, and attitudes concerning "brain death" and organ donation. Only 35% were able to identify the legal and medical criteria for determining death. Their own personal concept of death varied widely from person to person. Most of them (58%) did not use a coherent concept of death consistently; and 19% had a concept of death

that could be said to be logically consistent with changing the whole brain standard to classify anencephalics and patients in PVS as dead. The authors believe "the findings demonstrate confusion about correct criteria for determining death and differences in concepts of death that might prove troublesome to the transplantation enterprise."<sup>13</sup> Potential organ donors are usually victims of accident-caused trauma, sudden acute illness, or self-inflicted injury.<sup>14</sup> This means that a potential donor might be young and healthy-looking, which only adds to the uneasiness and discomfort that medical staff might experience when death is diagnosed using brain-based criteria.

If irreversible cessation of all functions of the entire brain, including the brain stem is necessary to diagnose death, why are auto-regulatory functions of the brain stem, such as cardiac rate, blood pressure, regulation of body temperature, blood sugar balance, endocrine function and salt and water balance ignored?<sup>15</sup> A dramatic example of this is related by heart surgeon Walter Weaver, who has performed a number of heart transplants. He had no reservations about believing he was performing a good for society, surely most medical personnel involved in transplantation feel that way. But one time he was evaluating a young motorcycle crash victim as a potential donor when something inside him changed. The teenager was on a ventilator, he had warm, healthy looking skin, self-controlled temperature, a sustained blood pressure, and he was producing urine naturally. "How could I say that this young man was dead?" asked Weaver. Shortly thereafter he stopped doing transplants.<sup>16</sup> Shewmon also found it disturbing that "some of the early cardiac transplant surgeons had at best ambivalent feelings about the vitality of the patients whose beating hearts they were cutting out, and at worst a belief that they were actually killing the donors but that this was justified by the saving of other lives."<sup>17</sup>

A study carried out at Johns Hopkins University on ten "brain dead" donor patients who were operated on without anesthetic showed that ten of the ten had a dramatic rise in blood pressure and heart rate as soon as the scalpel began to cut in for organ removal, symptoms also found in live patients undergoing surgery who are given inadequate anesthesia.<sup>18</sup> Anesthesiologist W. Andre Kofke says it may appear to the uninitiated that anesthetics are unnecessary during organ procurement since donors without cortical function cannot perceive pain from surgical stimulation. But, he acknowledges a sympathetic response to surgical stimulation such as tachycardia, hypertension, perspiration, and involuntary movement. This sympathetic response usually occurs within five minutes after the surgical incision, peaking within 5 to 20 minutes, but Kofke attributes this "mass reflex" to neurogenic vasoconstriction and stimulation of the adrenal medulla by the spinal reflex arc. Kofke says, "in addition, abdominal muscle tone may interfere with surgical exposure and involuntary



movement caused by spinal cord reflexes can be erroneously perceived as a sign of life." Neuromuscular blockers are given therefore to "obliterate the sympathetic response and involuntary movement and to provide satisfactory muscle relaxation."<sup>19</sup> Kofke speaks of spinal cord reflexes being present, but the Harvard criteria said there should be assurance of an absence of spinal reflexes in order to diagnose brain death.

Adding to the confusion, studies show that many patients (20% in one series) who fulfill the tests for brain death continue to show electrical activity on their electroencephalograms.<sup>20</sup> As noted previously, an EEG is not a required test to diagnose brain death in many of the criteria.

### **Dissent Increases**

In 1997, a flood started pouring through the dike's enlarging holes. Two prominent experts, D. Alan Shewmon (a world renowned expert in "brain death") and Robert Truog (an anesthesiologist and Harvard Medical School ethicist) writing in two different journals in the same month of February denounced the diagnosis of "brain death" as false death. Shewmon says that "at present, there is no reliable clinical criterion to distinguish early in the course between a dead 'brain dead' and live 'brain dead' patient — only in retrospect: some patients that rapidly and inexorable deteriorate despite intensive care may have been dead all along, and those that stabilize, at least for some days, should be presumed alive."<sup>21</sup>

Robert Truog contends it may be time to abandon the concept of brain death, because it is incoherent in theory and confused in practice. Moreover, he says the only purpose served by the concept is to facilitate the procurement of transplantable organs. He acknowledges that the organ supply could be decreased if the concept of brain death is abandoned, so proposes alternative strategies to organ procurement. One startling scheme accentuates the contrived notion of brain death when he says we might consider changes in the law that would recognize instances of "justified killing" for the purpose of transplantation.<sup>22</sup>

My primary ethical consideration at the outset was to be certain that death has taken place before retrieving an unpaired vital organ from the future donor. According to the UDDA, irreversible cessation of all functions of the entire brain including the brain stem equals death. The courts have accepted the UDDA brain-related criterion as a legally satisfactory definition of death, but is this definition adequate from a biological perspective? I believe the available body of evidence is sufficient to call into question the certainty of the diagnosis of brain death as true death from a biological perspective. In a large number of patients who fulfill requirements to be classified as "whole brain dead," doubt regarding the diagnosis is demonstrated by (1) Presence of auto-regulatory



functions of the brain stem, (2) Findings of electrical activity on EEGs, (3) Evidence of spinal reflexes. Though some involved in the transplant field seem to be able to ignore this fact, Truog thinks it significant when he says, "(T)he brain is physiologically defined as the central nervous system, and many clinically brain-dead patients retain central nervous system activity in the form of spinal reflexes."<sup>23</sup>, (4) Some patients exhibit signs of consciousness despite the absence of a functioning brain stem according to Joseph Seifert.<sup>24</sup> When these phenomena are present, how can it be said that there has been cessation of all functions of the entire brain, including the brain stem? If there is evidence of brain function, no matter how minimal, the prudent and ethical decision must be to presume life. Given these uncertainties and the general confusion within the medical profession, how can we say the patient is truly dead according to brain-related criteria? Removal of a vital unpaired organ from a person who cannot be declared dead with absolute certainty is a moral obstacle to that removal. It is morally unacceptable to perform an action that deliberately causes the death of that person, even if the good intended is to save the life of another human being.

Pope John Paul II framed the dilemma well: "... there is a real possibility that the life whose continuation is made unsustainable by the removal of a vital organ may be that of a living person, whereas the respect due to human life absolutely prohibits the direct and positive sacrifice of that life, even though it may be for the benefit of another human being who might be felt to be entitled to preference."<sup>25</sup>

### **Addendum**

Though I believe it is morally unacceptable to remove a vital organ from a living person, I wouldn't want to close the door on vital organ transplantation. There are so many people desperately waiting for the new chance at life that an organ could give them. More study and deliberation is called for in the fields of medicine, theology, and philosophy (ethics) to see if a morally acceptable method can be found.

Presently other avenues are being studied and attempted in the field of transplantation and I'd like to touch briefly on the issue of the non-heart beating donor (NHBD), though the topic deserves a separate paper. This is a controversial, complex process that isn't exactly new, since a variation of the NHBD is the way transplants were originally done. It involves taking a patient (one who's on a ventilator, but a decision has already been made to discontinue it as being burdensome, extraordinary, or the like) into the surgery suite, and turning off the ventilator. (This is already being done with diagnosed "brain dead" patients.) Before organ retrieval surgery begins, the surgeon waits until the heart stops beating and the person is

then declared dead by cardiopulmonary criteria. The amount of time to wait after the heart stops before declaring death is controversial at this time.

Also controversial is the question of whether or not to infuse patients with ice-cold organ preserving drugs before the heart stops because some contend those medications contribute to stopping of the heart, whereas others say they cause no harm.

There is so much we don't know and we need to remain open to new ideas and possibilities, but each new one must be examined within a moral framework that respects the life and dignity of the donor.

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