

# Concepts of death in medicine



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The concept of death is one that has been shrouded with mystery and wonder for as long as humans have lived and died. The understanding and implications of death have varied greatly across eras and cultures. Historically, there has been little consistency in the understanding of the concept of the event of death, the moment at which one is dead. The Oxford English Dictionary defines death as “ the end of life; the permanent cessation of the vital functions of a person [...] or organism[2].” This definition, while precisely written, leaves considerable ambiguity about the diction of the definition itself. It is uncertain what is meant by “ life” and “ vital functions” of a person or organism. Further, one may question whether the vital functions of humans as persons differ from those of humans as organisms. Is death a process rather than an event? If so, when does it begin and end, and when is it appropriate to declare death? Is it possible that a human may experience two deaths, death of the person and death of the organism? If so, which death is relevant to medicine? In this paper, I will review the evolution of the definition of death in the Western world in the context of advancing medicine, and explore the implications in relation to organ donation.

The philosophical examination of human death has concentrated two underlying questions: what is human death, and how can we determine that death has occurred?[3]The first question addresses the concept or definition of death, while the second concerns developing the corresponding standards: criteria and clinical protocol to be used to declare death.

Examples of the answer to the first question include *death as the functions*

*of an organism or human death as the irreversible loss of personhood*

(Stanford Encyclopedia of Philosophy, 2011[4]). Examples of answers to the second questions include the cardiopulmonary standard, the whole-brain standard, and the cerebral standard. It was not until the last century that seeking answers to these questions became the source of a painstakingly complex on-going debate about death, personhood and medicine.

Prior to the advent of the stethoscope in the 19th century, cessation of breathing marked the occurrence of death(Daroff)[5]. Then, the loss of pulse became the characterizing event (Jennett, 2001). The Fourth Edition of Black's Law Dictionary was published in 1951, reidentifying the occurrence of death as the “ cessation of life, defined by physicians as a total stoppage of heart of the circulation of the blood...”[6][7]in the United States. The definition of death (particularly the distinction between death of the body and death of the person) was not relevant because the death of the brain and the rest of the body tissues occurred concurrently. Cardiopulmonary failure inevitably led to irreversible loss of all brain functions, and the irreversible loss of all brain functions quickly led to cardiopulmonary arrest.

The issue of distinguishing between cardiopulmonary failure and brain function failure was not clinically relevant until the invention and widespread use of mechanical resuscitation and ventilation devices[8]. A stopped heart could now be restarted and blood could be oxygenated without functioning intercostal and pleural muscles, after the tissues of the brain had begun ischemic necrosis <sup>[1]</sup>. Although they were still occurring, the functions of circulation and respiration were being performed by mechanical respirators and defibrillators. While this did not meet the criteria for death as defined in <https://assignbuster.com/concepts-of-death-in-medicine/>

1951, it is important to note that such patients would have met the criteria for death as soon as the use of life-support machines was discontinued. Essentially, this meant that either death could be reversed, or that death could be delayed well beyond the failure of vital organs. This also meant that a body with irreversible loss of brain functions could be indefinitely kept “alive.” This highlighted the distinction between neurological failure, and circulatory and respiratory failure.

During the 1950’s, several physicians around the world began to recognize the futility of continuing treatment for patients who had lost all neurological functions. In 1954, a neurologist practicing in Massachusetts, Dr. Robert Schwab, noted this while examining a comatose brain hemorrhage patient who was on a respirator. “The question was, ‘Is this patient alive or dead?’ Without reflexes, without breathing and with total absence of evidence of an electroencephalogram, we considered the patient was dead in spite of the presence of an active heart maintaining circulation. The respirator was therefore turned off and the patient pronounced dead.” In 1959, four French neurologists came to the same conclusion. However, they some of them preferred the term *coma dépassé*, meaning “beyond coma”(Mollaret, 1959) [9]. This was the prognosis of certain death, they argued, but not did not meet the criteria for death itself. Schwab disagreed, stating that death of the the death of the nervous system would be death of the patient. In 1963, he proposed criteria to consider certain patients dead in spite of continuing cardiac function: loss of reflexes, a flat EEG, and apnea[10] [2]. Over the next five years, he reported having treated 90 such patients. None of them survived and autopsies showed that every one of them had pervasive tissue

necrosis in their brains. His findings went on to greatly influence the legal and medical redefining of death.

Meanwhile, there were developing concerns about the futility of extensive, expensive medical care for patients whose deaths were imminent and inevitable. In 1957, Pope Pius XII proclaimed that physicians were not obliged to give “ extraordinary” treatment in suchcases[11]. In 1962, psychiatrist Frank Ayd published a paper in which he contended that there was a moral obligation to withdraw care when death was inevitable. In 1965, The American Medical Association held it’s First National Congress on Medical Ethics and Professionalism to detail guidelines for end-of-life-care. [12]

As the initiation of the transition from heart to brain criteria for death, the field of organ transplantation was developing. The first successful kidney transplant was performed between live twins in 1954 by Dr. Joseph Murray. Eight years later, Dr. Murray performed a kidney transplant from a cadaver donor. In the years following, liver, lung and heart transplants were performed, using organs from cadavers. Most of the recipients died soon after the surgery. There was the idea that “ live donors” would improve the chances of survival, but physicians were weary about using vital organs from patients that were “ alive” by cardiopulmonary criteria, even if they had lost total brain function. The ethical standard regarding organ retrieval is the Dead Donor Rule (DDR), which prohibits organ vital procurement from donors that have not yet been declared death. This limits possible sources of organs to cadavers that still have salvageable tissues and organs. As medical technology prevented more and more “ deaths” through advancements in <https://assignbuster.com/concepts-of-death-in-medicine/>

life-support technology, it also accelerated the demand for organs of dead donors, as the capacity to perform successful transplants increased. This growing concern for organ transplantation sources, coupled with the futility of having “hopeless” patients on artificial ventilation and resuscitation created a climate that facilitated the major change that occurred at the end of the 1960s.

In 1968, an Ad Hoc committee was formed at Harvard University to address the “ethical problems created by the hopelessly unconscious patient [13].” The committee developed criteria similar to the concept of “coma dépassé.” Patients who met the criteria [3] would be considered essentially dead, but not actually dead. The final report was titled “A Definition of Irreversible Coma: Definition of Brain Death.” While this report didn’t explicitly realign the definition of death to brain-based criteria, it outlined appropriate standard of care for comatose patients whose deaths were inevitable and imminent. It was never said outright, but they implied that the death of the brain is the death of the patient, and hinted that the cardiopulmonary criteria for death were obsolete [14].

On the same day as the publication of the Harvard report, the 22nd World Medical Association (WMA) met and announced the Declaration of Sydney. The declaration distinguished the gradual process of the death of cells and tissues from the death of the patient. “Clinical interest lies not in the state of preservation of isolated cells but in the fate of a person [...] the point of death of the different cells and organs is not so important as the certainty that the process has become irreversible.” While it has been overshadowed in the United States by the Harvard report, the WMA’s declaration was the <https://assignbuster.com/concepts-of-death-in-medicine/>

first major committee distinction between the death of the body and the death of the person.

Throughout the 1970's, widespread acceptance of the implied Harvard definition grew among the medical community. State legislatures and courts began legally recognizing some form of death based on brain-criterion, although there was little consistency among the criteria across jurisdictions. In 1971, Mohandas and Chou (neurologist and psychiatrist, respectively) published their " Minnesota Criteria," based on autopsy discoveries that identified the destruction of the brain stem as the cause of brain death. Thus, the requirement for the EEG was eliminated <sup>[4]</sup>. Because both respiratory control and consciousness originated [15] in the brain stem, the loss of brainstem function equaled death of both persons and organisms. In the UK, the criteria for brain death was tweaked to exclude the EEG requirement, which meant a patient with detectable cortical activity would be dead in the UK and alive in most of the US.

The President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research was formulated in 1979 to clarify brain death and other biomedical ethics issues. The committee published a report in 1981 that provided a clearer and more practical definition of death than the previous, conceptually ambiguous ones that had been used before. The commission reasoned that death occurred when the " body's physiological system ceases to constitute an integrated whole [16]." Because the brain functions as the " great integrator and regulator," the death of the organism occurs when the total brain functions are lost, and the organism disintegrates to a collection of its parts. As a result, the Uniform

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Determination of Death Act (UDDA) gave both brain-based and circulatory-respiratory-based criteria a “ separate but equal” status in the eyes of law and clinical care. In the United States, death could now be determined by the “ irreversible cessation of circulatory and respiratory functions” or “ irreversible cessation of all functions of the entire brain.” While the UDDA recognized the whole brain standard as a means to determine death, it did not specify the neurological test criteria to be used. It also did not specify the amount of elapsed time required before stopped circulation can be considered irreversible. Different hospitals, providers, and associations used varying sets of tests to determine death.

In 1995, the American Academy of Neurology (AAN) attempted to standardize the clinical protocol used to determine death using brain criteria. Tests to be performed were similar to the Harvard report criteria, without the EEG requirement and the 24-hour repeat was left unaddressed. While the UDDA and AAN’s guidelines have brought consistency to the clinical process of determining death, there has been widespread disagreement about the criteria of death itself.

The traditional criteria for determining death, the cessation of heartbeat and breathing, have been updated by the UDDA. The circulatory-respiratory standard holds death as the *irreversible* cessation of circulatory-respiratory function. Leaving aside the implications of word “ irreversible,” this definition may still not be entirely accurate nor practical. Rather than changing the reality of the nature of death, life-support devices and other technologies of modern medicine have shined a light on an aspect of the process of death that was not visible before. Before the possibility of mechanically and



artificially continuing respiration and circulation, the failure of these processes were associated with the occurrence of death. However, after such “ death” could be reversed and put off indefinitely, it became apparent that the onset of cardiopulmonary failure was not the moment of death, but simply indicative of death. As Bernat, Culver and Gert argue, heartbeat and regular breathing usually indicate life, but they do not constitute life(Bernat, Culver, and Gert 1981)[17]. “ Life involves the integrated functioning of the whole organism.” Brain-based criteria better suited this understanding of life because the brain is responsible for much regulation of the entire organism. Thus, including brain-based criteria to declare death is seen as an “ update” to the previous understanding of death, not a complete overhaul of it.

The transition to brain-based criteria is nowhere near free of criticism. For some, one of the most obvious flaws in the logic behind the brain-based criteria for death was its basis on the idea that the brain is the sole organ responsible for integration of the organism as a whole. If death is defined as the irreversible loss of functioning of the organism as a whole, then only after the complete cessation of all whole-body integrating functions may a patient be considered dead. While the brain plays the biggest role in integrating interdependent functions of the body, somatic integration is a holistic phenomenon that involves organs and tissue systems throughout the body. Immune responses, regulation of blood glucose levels, and hematopoiesis are regulatory functions that can continue to occur without the entire brain(Shewomn, 2001)[18]. Therefore, if the definition of death is understood to be the end of the existence of the organism as an integrative

whole, then the death of the whole brain does not necessarily mean the biological organism has died.

Brain-based criteria may have been a step in the right direction, but perhaps for the wrong reasons. The significance and necessity of the brain may lie in another aspect of its function; one that cannot be attributed to any other part of the body: personhood. The brain is the origin of human thought, reasoning, consciousness, emotion, and self-awareness. If the entire brain is dead, then the human person is dead, even if the human organism continues to live.

Another problem with the development of brain-based criteria is again unrelated to the concept itself, but how it came about as standard of care. The ethically dangerous notion that the climate of evolving medical innovation, particularly organ transplantation, had influenced and driven the acceptance of whole-brain death is a very concerning one. When the Harvard committee met to discuss brain death in 1968, they seemed to be concerned about two things: the futility of spending resources on patients with no chance of recovery, and the idea of wasting the organs of these patient's bodies. Their main focus of concern seemed to not be the well-being of the patients at hand, but protecting the physicians who would withdraw care from patients that would previously have been considered alive. Without the redefinition of death, doctors would have been morally responsible for the death of such patients.

Officially, the reason the Harvard committee cited for their efforts was to free up resources spent in vain on untreatable patients. Murray, who was on the

committee specified that the primary concern was the dying patient, and that organ transplantation was “distinct and unrelated,” ([19]) However, many have been skeptical of this separation, arguing that the motive for changing the definition of death had everything to do with organ transplantation. Neurosurgeon Richard Nilges, calls attention to the fact that respiratory and other life-support technologies had been in use for nearly two decades before the hasty formulation of the Harvard committee, and no one had so loudly expressed the urge to end such care. Instead, he points out, that the Harvard committee met less than a year after the first successful heart transplant surgery. [5] Based on the heart-lung criteria of death at the time, the act of removing the heart from a “live” patient on life support would have been the cause of death of that patient. Nilges suggests that a second, underlying reason for changing the criterion of death was the underlying motivation behind the Harvard report: providing organs for transplantation. This situation was an ideal one for organ transplant advocates, because it was an “opportunity to tailor the definition of death to fit the moral acceptability of transplanting living hearts. Taking a beating heart from a body is not equivalent to taking innocent human life if ‘brain dead’ individuals are ‘defined’ as already dead.” Interestingly, Nilges is not against the idea of using brain-based criteria for death in organ donors. Rather, he disagrees with the way this criteria is practiced. His experience working with such patients and organ transplant teams has left him with disdain towards the practice of organ transplantation. In his paper titled “Organ Transplantation, Brain Death, and the Slipper Slope: A Neurosurgeon’s Perspective,” Nilges proposes a causal relationship between the changes in the understanding and practice of death declaration to the desires of the

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insatiable transplant advocates. He recalls trying protect his dying patients from transplant teams, who he compares to hungry vultures eyeing a small, dying animal. He criticizes the unofficial leeway allowed when diagnosing whole brain death, pointing out that over 20% of patients declared dead on brain-based criteria actually had brain activity detectable by an EEG.

Save for the finale: [HANS JONAS: uncertainty about border b/w life, death[20]]

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[1] Necrosis, death of tissue, can be caused by ischemia, insufficient blood supply to those tissues. Brain tissue is among the body's most sensitive to ischemic hypoxia, and is the earliest to die. It is possible for the rest of the body to regain function after a period of time without oxygen, but the brain to have lost it permanently.

[2] Schwab's criteria were: loss of reflexes (dilated and fixed pupils, no elicitable reflexes, and no independent movements), a flat EEG (electroencephalogram detecting no electrical activity in the brain), and apnea (inability to spontaneously breath).

[3] Harvard report criteria included the following: (1) deep coma, no withdrawal from painful stimuli, (2) cranial and spinal reflexia, (3) apnea, persistent after disconnected from ventilator for 3 minutes, (4) flat EEG, no detectable electrical brain activity, (5) exclusion of hypothermia or drugs, which may sometimes cause false-negatives in the above tests, and (6) evaluation repeated twice, 24-hours apart.

[4] The brainstem is the pathway through which the brain (cerebrum and cerebellum) sends and receives signals to and from the rest of the body. If the brain stem is dead and all brainstem functions are lost, then the communication between the brain and spinal cord is severed. A body of a patient with a dead brain stem is functionally equivalent to that of a patient with whole brain death. Thus, any electrical activity in the cerebrum is not going to affect the outcome of tests of the rest of Harvard criteria.

[5] The first successful heart transplantation was performed in December of 1967. The committee developed their criteria in August of 1968, a mere eight months after the heart transplant.

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[1]Write later

[2]Cite oxford english dictionary

[3]either cite Stanford Encyclopedia of Philosophy. Definition of Death

[4]Written 2007, revised 2011. Review?

[5]Fix citation

[6]Cite this

[7]Black Law's Dictionary, 1951. 4e

[8]cite source: either de goergia, stanford, or daroff

[9]#8, De Geogia

[10]cite swchab, from de georgia, pg 674

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[12]another someone talks about this conference, but says something more relevant.

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[14]cite this

[15]use a different word. Plagiarism

[16]cite this: de georgia, #48, 49. pg 676

[17]cite. (stanford encyclopedia, 1. mainstream view)

[18]<http://www.ncbi.nlm.nih.gov/pubmed/11588655>

[19]Murray, letter to Beecher, calling for committee formulation/meeting. De Georgia # 26, pg 675

[20]#40 De goergia, pg 676