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Legal and Medical Relevance of Establishing the Moment of Death

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Abstract

For centuries, death has been defined, from a medical point of view, as the irreversible cessation of breathing, circulation and activity of nervous system.

The actual techniques of reanimation, by giving the possibility of artificial surviving (the so called living dead) and by blurring the barrier between life and death, have brought into question the problem of establishing the moment of death.

If in real death, the criteria for establishing death which are cessation of any vital functions, indicated by cessation of heartbeat and no breathing, are clear and the determination of timing of death doesn't raise any medical, ethical or legal problems, controversy arises when referring to brain death.

From a medical point of view, the biologic organism is still alive as long as the heart continues to beat although conditioned by artificial breathing. But, in conformity with the definition of the status of a human being, in terms of legal and ethical criteria, a person may be considered deceased independent of the status of the biological body.

Issues raised by the timing of death, in particular cases as that of brain death, are reflected not only in medical field but also in civil and penal law. Consequences of the death of a person are legally passed on all aspects of ending of his civil capacity: the opening sequence, ending of civil rights and obligations of individuals, etc.

The fact that Law 95/2006 clearly states that organs can be harvested both from those who are brain dead and from those with irreversible cardio-

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respiratory stop, they being declared dead without doubt, clears up, in terms of legal considerations, the status of persons in this situation.

Another problem of keeping alive the body in order to take over organs for transplantation is the preservation of human dignity. When a brain dead person (in all senses that are involved in the definition) is declared dead we deal with a body, kept alive but which lacks both the rights of a living individual and of a deceased person.

Keywords:

timing of death, brain death, legal considerations

Introduction

Timing of death is strongly conditioned by its definition and diagnosis criteriologia. Therefore, this paper starts by defining the dead, discusses issues related to diagnosis criteriologia used to finally get legal and medical issues when determining death.

Definition of death

Defining human death is as relative as the definition of life, on which it depends directly, both being in relation to the sum of multiple and varied ways of manifestation. A unified and overarching definition of death is an elusive goal, given that death is acknowledged and appreciated differently depending on the perception of the world, of the individual, reflected and conditioned by social organization, tradition, religion, etc. Defining death also depends on the value system specific to each field of activity, the medical definition itself being influenced by philosophy, theology, scientific discovery and not to forget, political and social priorities, etc.

From a philosophical perspective (Damian et al, 2012; Sandu, 2012a, 2012b), defining death depends on the one providing the definition. According to Hegel, the main figure of idealism during the 19th century philosophy, “death is the triumph of species over individual, thus underlining the benefits of the individual disappearance? on the progress of the entire mankind”.

Epicurus stated that “...*Death is nothing for us*, for when we exist, it doesn't, and when it comes up, we no longer exist. The whole of good or evil is given by sensations, and death is the very absence of such.” This

materialistic approach is based on the assumption that death is a spontaneous ending of our sensuous experience and, thus, a form of non-existence. Therefore the matter is not of transition, but simply an abrupt ending (Clement, 2000). Camus, an important name for existentialism, asserts that every man is free to give meaning to his own death, an idea set on the borderline between idealism and materialism (Epicurus, 1971). Although hesitating to answer fundamental questions regarding the clash between life and anything that might come after, such a thesis emphasizes the very act of dying, a gesture that becomes fundamentally important in the man's interior and individual search. (Fraser, 1999).

According to the Orthodox Church, death is, first of all, a spiritual phenomenon that stands for the primordial dismissal, the man's separation from Life, therefore God himself, as a result of disobedience (National Commission of Bioethics Church and Society sector of the Romanian Patriarchate, 2004). Physical death is the derived effect of spiritual death and it involves the separation of the soul from the body, the first step to going back to the Fountain of Life. This is why the patristic tradition calls the dissolution of the body "God's benefaction towards man, so that evil will not linger forever after" (Chirila et al, 2008).

Relating to philosophical mechanisms, life represents the sum of the physical, chemical and mechanic actions through which the body accomplishes its functions: metabolism, reproduction, excitability. On this background, death may be seen as a process that brings these functions to an end, as a consequence of complete and definitive disappearance of input, transportation and use of oxygen at cell level.

Anthropologists define human life as a sum of three levels, interconnected and hierarchically placed: organic/ physiologic, psychic and social. The life of the organism is based on the integration and coordination of body functions necessary to maintain the organism as a whole. Psychic life depends on the physiologic one and, in the case of the adult, conscious man, it contributes to the perception, integration and reaction of the individual. Social life definitely requires for the previous two levels, and it represents the person's integration and status. Given this definition, one must sense the difference between the death of the biological organism and that of the person, the latter being the

cessation of all three levels, the climax of which is the social life, places at the top of the hierarchy (Vealth et al, 1976).

Legally speaking, death is associated with the suspension of the individual's civil status, thus making him no longer be a subject to law.

Reported to physiological mechanisms with reference to us, life is the sum of all physical, chemical and mechanical processes by which the body carries out its characteristic functions: metabolism, reproduction, excitability. Death is the process by which these functions cease, as a result of complete and final disappearance of the intake, transport and use of oxygen at the cellular level. Tissues have different resistance to lack of oxygen, linked to their phylogenetic age, making that the most recent phylogenetic tissues be first excluded from the life cycle (Belis et al, 1995). The body survives on account of old structures, so that death is a process that extends over a variable period of time. Brain, particularly layers 3-5 of cortex, the most recent phylogenetic structures, are most susceptible to lack of oxygen and are the first to degrade irreversibly, being suggestive that this organ needs 0.7 l blood per minute and consumes about 22% of whole body oxygen. Other structures have a different resistance to anoxia: striated muscle withstands 30 minutes, smooth muscle 2 hours, germ cells 10 hours, etc (Medical Consultants on the Diagnosis of Death to the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, 2001).

Types of death

Death process progresses over time, irreversible tanatologic changes, becoming gradually deeper and wider.

Clinical death, the consequence of stopping breathing and cardiac activity without cell death, is the stage of transition from life to real death. By applying effective methods of cardiopulmonary resuscitation during the first 3-5 minutes, clinical death can be reversed. Resuscitation maneuvers, targeting the resumption of the activity of the vital organs, are effective if applied before irreversible nerve cells damage due to hypoxia, otherwise recovery from clinical death claiming neuropsychological sequelae of variable severity, up to permanent vegetative state (Belis et al, 1995).

Clinical death and its potential reversibility, in terms of those who experienced it, was the subject of literary and scientific descriptions.

In "Life After Life", R. Moody gathers from the survivors from clinical death the description of symptoms such as loss of bodily sensations, particular bright sensations after leaving a dark tunnel, phenomena whose sequence is as follows: at first the subject feels a detachment from his physical body who is perceived as something external, followed by entering a dark tunnel and then a light one, the person seeing what and how he was as a human being. Hypermnesia of this state brings a maximum objective look upon his life followed by a light spectrum and, finally, regret of coming back from it. Physiopathological phenomena described above were interpreted as due to brain anoxia, especially occipital.

The short period of clinical death is followed by *real death* (biological), which is the final, irreversible stage of death process. Following the installation of this phase, changes caused by cadaveric processes, known as "signs of real death" occur.

An interesting condition, which stimulated the imagination over time, but also people's fear, is *apparent death*, called by some authors catalepsy, which corresponds to a deep depression of vital functions of the brain (manifested by coma), heart (demonstrated by no pulse and collapse) and respiration (marked shallow breathing). Given the extremely low expression of vital functions, which still exist, clinical perception is difficult and might result in errors of the diagnosis of death. The reality of apparent death, clinically found, sometimes during necropsy or exhumation (by observing changes of corpse position in the coffin) was described in a number of 27,000 cases in the XIXth century in England, especially during major epidemics, and now reaches about 40 cases per year in Spain and Italy and one in 800 exhumations in the U.S., according to the coroner . Apparent death may be a medical reality, especially in cases of poisoning with opium and sleeping pills, electrocution, hypothermia, epilepsy, severe anemia, several inhibitions, neglected dehydration, etc., which requires a monitored finding of cessation of vital functions to justify abandoning resuscitation effort.

Brain death represents the irreversible cessation of the whole brain functions (cerebral hemispheres and brainstem), and is clinically characterized by deep coma.

The concept of brain death was officially introduced in 1968, by the "Ad Hoc Committee of the Harvard Medical School," according to it

irreversible coma being associated with brain death and considered as a criterion of death of the individual.

Definition of brain death has occurred as a utilitarian type solution to allow timely provision of viable organs for transplant, thus solving a social problem increasing the frequency. But this approach can lead to attempts to model the definition as needed and not necessarily scientific truth.

Initially, brain death was the equivalent of the death of the entire brain. Subsequently, some authors affirmed that the death of the brain stem equals brain death since it involves the disappearance of the integrative functions (respiration, cardiac activity), in which case the cortical activity is no longer sustainable. As a consequence of the organ crisis, the notion of imminent cerebral death is introduced, in which are included those who do not meet all the criteria for brain death.

Criteria of death diagnosis

Death as a whole, is a process that can not be reduced to a single moment. Declaring the death of a person, however, must be made at some point in time, so that detection of the organ / organs whose loss of activity is equivalent with death, and the identification of the criteria that can define the ceasing of the functions of this organ/these organs was over time the real challenges for the medical world and for the society.

In ancient Greek and Roman society, the criteria for determining death were the absence of breathing and heart beat and occurrence of putrefaction.

In the Middle Ages, death certification was made with the flame of a candle held in front of the nose of the deceased, a flickering of the candle being considered a sign of life.

Danish anatomist Jacques-Benign Winslow recommended in 1740, the resuscitation of the patient who seemed lifeless by stimulating the body in ways more or less weird going up to the introduction of needles under the nails.

In 1742, John Bruhier created a true hysteria with his “Disertation de l’incertitude des signes de la mort”, in which he presented 52 cases of buried alive persons. To people's fear of death was added the fear of being buried alive, so many individuals asked doctors to diagnose death based on more reliable evidence. In this context, the German medical society concluded that putrefaction is an infallible guide

to establish death conclusion that led to mandatory compliance of a time interval between death and burial, to allow installation and establishment of putrefaction, varying according to climate.

For centuries, death was derived from the cessation of cardiac and respiratory activity, followed by brain death. When the heart ceases to beat, the brain can live only for several minutes. When, however, first cortex activity ceases, the heart can keep working hours or even days due to its increased resistance to lack of oxygen. Progress in Reanimatology, the mid-1950s, allowed the latter possibility to be a reality that can be extended virtually indefinitely. therefore It became, , possible to keep "alive" patients in state of brain death by respiratory and cardiac support functions (Pallis, 1985).

Currently, diagnosis of brain death is established, with slight variations in different countries especially about the time of surveillance, based on the following criteria offered by the "Ad Hoc Committee of the Harvard Medical School," : three clinical signs: absence of visible reaction to external stimuli, absence of breathing and of spontaneous muscular movement for at least 1h, absence of reflexes (pupil, cornea, etc) and a paraclinical sign: the flat EEG line for at least 10 minutes (Ad Hoc Committee of the Harvard Medical School to Examine the Definition of Brain Death, 1968).

In 1981, in response to the dilemmas created primarily by the discussion and different interpretations of the concept of brain death, the American Medical Association, American Bar Association and the Commission together with the Bioethics U.S. President issued Determination of Death Act Uniform (UDDA), which states that death is the permanent loss of the body's ability to function as a whole and not as a sum of its parts, resulting in progressive loss of decay and entropy (Medical Consultants on the Diagnosis of Death to the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, 2001).

Cessation of functioning of vital organs and metabolic processes that characterize the living is followed by progressive installation of cadaver processes, leading to the disintegration of the body and its conversion to a skeleton.

Cadaver processes have different expressions that can be detected and used to determine with certainty the diagnosis of death and

to estimate the time elapsed from the moment of death. Cooling corpse is a variable rate depending on many environmental factors (temperature, wind, humidity, et.) or related to the particular conditions of the corpse (size, fat thickness, position, ante-mortem pathology, etc.). cadaver lividity, usually red-purple spots, cadaver rigidity manifested by stiff muscles and thus "locking" joints and dehydration of the cadaver, are signs of desintegration . Putrefaction is a process that ultimately will destroy all soft parts of the corpse, making it into a skeleton (Belis et al, 1995).

Importance of establishing time of death:

As shown, as a whole, death is a process of several stages. Declaring a person's death, however, must be made at some point in time, that is at the death of the organ that characterizes and defines the death of the body (Pallis, 1985).

Medical authority alone can guarantee the finding? of death. The Doctor has the duty to ascertain and declare death, to determine time of installation and the causes of death. Determination of death has, however, distinct relevance and usefulness depending on medical specialty.

The Coroner determines the time of death retrospectively, based on the stage of developing real signs of death revealed by forensic autopsy. They have great importance in solving cases of murder or suspicious death, the timing of death guiding judicial inquiry.

For the family doctor it is important to establish with certainty the diagnosis of death and preparation for writing the death certificate.

In resuscitation and intensive care services, appearance of the signs preceding death and their clinical and early detection, allow efficient targeting of resuscitation maneuvers. Finding the signs of irreversibility allow the interruption of resuscitation maneuvers and the official declaration of death.

A particular case is brain-dead patient. Correct and early diagnosis, with follow-up, according to the protocol, is most relevant to organ transplantation. Once brain death diagnosis is set, it is important to continue medical maneuvers to maintain vital functions at an optimal level to ensure the future viability of organs for transplant. At the same time, all necessary actions will start for obtaining the donation agreement from the family, preparing the team to harvest organs, finding the

potential transplant recipient. For bigger success of the transplant, all these actions (Damian et al, 2013) must be carried out as soon as possible, and as such establishing the moment of brain death installation as accurately as possible is critical.

However, society holds its reserves in considering someone in a state of brain death as actually dead, mainly because of the light this casts upon the clear definition of death (Siminoff, 2004). Were we to consider organ transplant, ceasing the medical care of someone considered dead might lead to the impossibility of harvesting certain organs such as the heart, which might cause prejudice to potential receivers and deprive them of a surviving chance (Calixto, 2010). This approach also has implications from the point of view of human dignity (at least for what it was, if not for what it is at that precise moment!), given that the patient in the state of cerebral death is declared dead, whereas his body is still kept alive, deprived both of the rights of a living person and those of a deceased. The artificial support of vital functions is obtained by means of aggressive treatments aiming exclusively at preserving the organs to be transplanted to another person/ other people (Calixto, 2007). The one who actually benefits this medical maneuver is not the one in the state of brain death, with no chance of surviving, but the one who might receive his organs (Shewmon, 2009). In this case, we might consider the idea of an abuse or of exploitation of a defenseless body to the benefit of another individual, (Shewmon, 1997).

Art. 3 from the universal declaration of human rights guarantees each human being the right to life; in the case of euthanasia we can even speak of a human right to death (Green et al, 1980). What can be appealed to in the case of a neither dead nor alive human? Does a cerebrally dead still have the right to an identity? (Engelhardt, 1978)

Taking into account the fact that brain death and somatic death may occur in different moments in the case of the same patient and the fact that between the end of cardio-respiratory activity and that of cerebral activity there may be a period varying from hours to days, it is essential to accurately decide when the person can be declared dead, with all the ensuing consequences (Steineck, 2003).

Consequences of the death of a person are legally passed on all aspects of ending of his civil capacity: the opening of succession, the

termination of his civil rights and obligations etc. Declaring the death of a person has repercussions also in life insurance. Honoring or not the insurance policy, with all financial implications concerning the family and insurance company, may depend on the declaration of death of a person connected to the ventilator, diagnosed or under diagnosis of brain death, (Boroi, 2002).

In succession, determining death can be important whether when we are referring to the prospect of leaving a legacy or to the potential heir. In order to open the sequence and to transmit the legacy of the law, the person who leaves the legacy must be declared dead. In terms of heir, he must exist in the opening sequence, so he has to be alive. If a person is declared brain dead, has he the right to identity and arising out of this, does he retain the civil capacity? From a legal point of view is he dead or alive?

Given that brain death and somatic death may occur in the same person at different times and that between the cessation of brain activity and cessation of cardiorespiratory activity may interpose an interval of time ranging from hours to days, it is essential to determine when a person can be declared dead, with all effects therefrom.

In Romania, judicially speaking, death is defined in the 95/ 2006 Act referring to health reform, where the matter of organ transplant is mentioned and brought under regulation. In title VI chap. II regarding “Donation and donor of organs, tissues and human cells”, art 147, align. 1, the *deceased donor* is defined as the person that was found to have ceased cardio-respiratory activity, non-resuscitable and irreversible (somatic death), and in align. 2 of the same article, the deceased donor with cardiac activity is defined as the person that was observed to have irreversible cessation of all brain functions (brain death), according to the protocol for declaring brain death in Annex no. 3 of Law no. 95/2006. .

It is thus decided that organs may be harvested both from those in a state of brain death and from the ones with non-resuscitable and irreversible cardio-respiratory cessation, as they are declared dead.

In the light of these aspects, we can conclude that both medically and legally, brain death is considered to be a person’s time of death. This conclusion influences all the judicial consequences as to the ending point in the civil capacity (New Civil Law).

Conclusions:

Making the difference between the death of a person (also at a mental and social level) and the death of the biological body may lead to a different interpretation concerning the definition of death and therefore of the moment it is generated, according to the criteria it uses. The concept of cerebral death keeps triggering controversy, despite the fact that in the case of the traditional definition of death, as the irreversible cessation of the cardio-respiratory activity, establishing the time of death raises no medical, ethical or legal issues. Medically speaking, the biological organism is still alive as long as the heart continues to beat, conditioned, however, by artificial respiration. Nonetheless, according to the definition of the human being from a legal and ethical perspective, a person is declared deceased when all the levels of his or her life no longer exist?. In these situations, it is also impossible to preserve the biological level unless the essential biological functions are artificially supported. The controversy of brain death actually springs from the identification of this concept with that of biological death of the person; what differentiates the two is made by whether the mental features in the definition and individualization of the human life and death are accepted or not.

The fact that law 95/2006 clearly states that the organs can be harvested from brain-dead people as well as from those with non-resuscitable and irreversible cardio-respiratory stop, means that they are declared dead without doubt, and explains, in legal terms, the status of persons in these situations.

In terms of scientific discoveries and research results that are put into practice with remarkable rapidity, medical and legal criteria are not always reliable and their rules should be guided. Issues of ethical, legal, social occurrence derived from dilemmatic cases are left behind, old rules and regulations being rapidly overtaken by situations that require new approaches, emphasis on/ emphasizing respect for human dignity.

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