



# **The Uncertain State of Mortality: Reconsidering the Intricacies of Death in the Context of the First Human-to-Human Heart Transplant Surgery**

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# **The Uncertain State of Mortality: Reconsidering the Intricacies of Death in the Context of the First Human-to-Human Heart Transplant Surgery**

**Ashley Clark**

## **Abstract**

This article covers the legacies of the first human-to-human heart transplant performed by Christiaan Barnard and his team on the 3<sup>rd</sup> December 1967 at the Groote Schuur Hospital in Cape Town, South Africa. The investigation into this subject is to emphasise its significance from a socio-medical stance as success in this procedure allowed for medical engineers to not only be able to perform an unthinkable surgery like a heart transplant but also encourage an innovative discipline which interprets the process of death in line with advances in medical technology and understanding. By looking at a series of ideological standpoints which theorise the multi-faceted brain death concepts, this scholarship highlights how the brain has replaced the heart as the centre-point of ascertaining death. In summary, this article gives agency to a topic which is largely unexplored but remains imperative to understanding how the concept of Brain Death has become a medically and socially accepted ideology; one that is fundamental to concluding whether an individual is dead or alive.

**Keywords:** Electroencephalogram, Human heart transplants, Brain death, Cape Town Symposium, Donor, Christiaan Barnard, The Harvard Committee, The Presidents Commission

## **Author Biography**

Ashley Clark is a graduate of the University of Derby. He received a First Class Honours in History which sparked a passion in medical history. He is currently completing a Post-Graduate Diploma in Secondary Education History at the University of Birmingham before beginning his teaching career as a Secondary School History teacher at Birmingham Ormiston Academy. His interest in this field stems from his ability to produce valuable work in a significant yet unexplored area of history.

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## Introduction

The concept of death has various interpretations that are shaped by cultural and spiritual connotations. The success of the first human heart transplant on December 3<sup>rd</sup>, 1967 experienced by recipient Louis Washkansky remains one of the most ground-breaking medical procedures of the twentieth century; leading to, as Martin S. Pernick insinuates, fraught considerations about the meaning of death because of the possibilities now posed by the successes of heart transplant surgeries. Pernick highlights how this surgical breakthrough was the latest stage in a long history of controversies about death and its interpretations.<sup>1</sup> The technological innovations in medicine that appeared in the post-Second World War period, particularly in the 1960s, partnered with the tremendous success of the first heart transplant in 1967, created a new discourse in the field of death; one that shifted the focus from the heart as the central system of the body to the brain having the utmost importance when determining an individual's state. Whilst there are many different types of 'brain death' such as those explored in Ben Sarbey's article on death and its definitions, this latest development in the topic of death allowed contemporaries and historians to approach the matter of death from a completely different angle.<sup>2</sup> This new perspective is displayed by historian Robert Veatch and his compelling summary of death stating that 'death is the irreversible loss of that which is essentially significant to the nature of man.'<sup>3</sup> Despite the multiple ambivalent stances that are present about mortality, an undeniable factor is the emergence of medical technologies and their ability to reconstruct the traditional paradigm. Advances in medical science and equipment are responsible for brain death becoming a legally acknowledged alternative to the traditional cardiopulmonary definition<sup>4</sup>, which

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<sup>1</sup> Pernick, M. S., 'Brain Death in a Cultural Context: The Reconstruction of Death, 1967-1981' in Youngner, S. J., Arnold, R. M., Schapiro, R. (Eds.) *The Definition of Death: Contemporary Controversies*, (Baltimore and London: John Hopkins University Press, 1999) See also: Macdonald, H., 'Considering Death: The Third British Heart Transplant, 1969', *Bulletin of the History of Medicine*, Vol. 88, No.3 (2014) p.495

<sup>2</sup> For the different types of brain death see: Sarbey, B., 'Definitions of death: brain death and what matters in a person', *Journal of Law and the Biosciences*, vol.3, issue 3 (2016) 743-752

<sup>3</sup> Veatch, R., *The Whole-Brain-Oriented Concept of Death: An Outmoded Philosophical Formulation*, 3 J. THANATOL. 13, 23 (1975). Cited in: Sarbey, B., 'Definitions of death: brain death and what matters in a person' p.747.

<sup>4</sup> The cessation of adequate heart and respiratory functions which results in death without reversal. This definition now became permeable due to the inventions of medical instruments which could now keep humans alive through artificial means.

remained unchallenged until the success of the heart transplant in 1967. This article will analyse the effects of the first human-to-human heart transplant and how this procedure acted as a driving force in the process of redefining death. It will use scholarly observations from contemporary surgeons and specialists in the cardiac field such as Dr Denton Cooley, Professor Christiaan Barnard, Dr Adrian Kantrowitz, and Dr Pierre Grondin; all of whom were present at the Cape Town Symposium in 1968 to discuss the legacies and experiences with human heart transplantations. Observations made by these professionals, amongst others, will support the need to compromise on a valid and accepted meaning of death that is both necessary and effective.<sup>5</sup> Addressing these features will relay the overall theme of the article which highlights the significance of the heart transplant and its ability to encourage evolved socio-medical doctrines about death and its occurrence.

### **The Heart Transplant and the Foundations of Death in a Modern Context**

The success of Professor Christiaan Barnard and his surgical team on December 3<sup>rd</sup>, 1967, remains one of the most ground-breaking innovations in medicine.<sup>6</sup> A striking observation about Barnard's success is not the technicalities required to perform it but rather the location where it was conducted. Barnard had spent years observing pioneers in the surgical world. Witnessing the legal setbacks that were apparent in the US, Barnard stated to a pump technician working in the US that 'you have too many prohibitions to negotiate before you can find a donor. We have no such obstacles in South Africa.'<sup>7</sup> Barnard knew that the agreement of only two doctors was required to declare death through irreversible brain damage and he sensed an opportunity in South Africa; one that could manipulate the less restrictive legislation around death, as the regulations in the US were more established and firmer.<sup>8</sup>

Unorthodox requirements necessary to completing a heart transplant such as finding an appropriate number of willing donors and removing a beating heart from a patient in a persistent vegetative state who would still be traditionally labelled as 'alive' created a grey area in ethical considerations. The realisation that donors were needed to support the

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<sup>5</sup> Youngner, S. J., Arnold, R. M., Schapiro, R. (Eds.) *The Definition of Death: Contemporary Controversies*, (Baltimore and London: John Hopkins University Press, 1999) p.37-67

<sup>6</sup> For context see: Cooper, D. K. C., *Christiaan Barnard: The Surgeon Who Dared* (UK & US: Fonthill Media 2017) p.187

<sup>7</sup> Quote from, McRae D., *Every Second Counts: The Race to Transplant the First Human Heart*. New York: G. P. Putnam's Sons; 2006. Cited in: Alivizatos, P. A., 'Fiftieth anniversary of the heart transplant: The progress of American medical research, the ethical dilemmas, and Christiaan Barnard', *Baylor University Medical Centre*, (4) October 2017.

<sup>8</sup> Cooper, D. K. C., Cooley, D. A., 'Christiaan Neethling Barnard, 1922-2001', vol.104, No.23. p. 2756-2757

practicality of this procedure generated uncertainty in both the public and professional spheres; mainly because giving an individual a donor status is essentially synonymous with declaring death. Despite the proliferation of successful heart transplants since Christiaan Barnard's success in 1967, this field remained largely unexplored and left contemporary professionals and members of the public anxious about the long-term effects of heart replacements. To tackle these social and ethical issues around death, transplant surgeons advocated a revised definition of death which was compatible with the revolutionary surgical innovations of the period. Medical transformations such as ventilators ensured that key organs such as the heart and lungs could now be maintained artificially. Transplant surgeons believed that the traditional criteria of death were now invalid and that a death centring its focal point on the brain was more appropriate for the evolving medical climate. Thus, the growth of human heart transplants became pivotal to debates on death and how it is defined.

The development and progress in hospital equipment throughout the twentieth century were critical to the success of heart transplants. The use of a ventilator provides patients with serious brain injuries a chance of recovery by providing the body with enough oxygen so their heart continues beating and circulating oxygenated blood.<sup>9</sup> In the context of heart transplants, this machine sparked mass debate as death by cardiopulmonary means was now reversible and, as David Rodriguez Arias has suggested, the ventilation machine and its presence contributed to a readjusted approach to determining death.<sup>10</sup> As heart transplants were now in the public domain, Martin Pernick highlights the emergence of two key concerns for both the public and professional sphere: the fear of being pronounced dead before appropriate and therefore overhastily being designated an organ donor, and the fear of being kept alive too long as a 'vegetable' with severe, irreversible brain damage.<sup>11</sup> Concerns like these were used by transplanters to highlight the ambiguities of death and because the heart transplant was used to treat people with heart failure which was the biggest killer during this period, Barnard justified the extraction of organs from brain-dead patients on life support by suggesting that they were extracting organs from people who existed in a

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<sup>9</sup> Macdonald, H., 'Considering Death: The Third British Heart Transplant, 1969', *Bulletin of the History of Medicine*, Vol. 88, No.3 (2014) p.500

<sup>10</sup> Rodriguez-Arias, D., 'Together and Scrambled. Brain Death was conceived in Order to Facilitate Organ Donation', *Dilemata*, 23 (2017) p.57-87. Cited in: Ave, A. D., Shaw, D., Bernat, J., 'Defining Death in Donation after Circulatory Determination of Death', in (eds.) Lena Hansen, S., Schicktanz, S., *Ethical Challenges of Organ Transplantation: Current Debates and International Perspectives* (Bielefeld: Transcript, Bioethics/Medical Ethics 2021) p.117

<sup>11</sup> Pernick, M. S., 'Brain Death in a Cultural Context: The Reconstruction of Death, 1967-1981' in Youngner, S. J., Arnold, R. M., Schapiro, R. (Eds.) *The Definition of Death: Contemporary Controversies*, (Baltimore and London: John Hopkins University Press, 1999) See Also: Lock, M., *Twice Dead: Organ Transplants and the Reinvention of Death*, University of California Press, London 2002. P.78

no-man's-land between life and death.<sup>12</sup> The feasibility and availability of donors were now becoming a priority as this would help protect the longevity of heart transplants, and the presence of the ventilator now served as an inadvertent obstacle that was as beneficial to the concept of heart transplants as it was disadvantageous. This is because the ventilator could now sustain the heart by allowing it to function normally. This created a difficult conundrum between deciding whether to hold out for the unlikely but potential recovery of a patient, or whether to extract a perfectly healthy heart from someone who was in an irreversible state of brain death to help others with heart failure.

The heart transplant was an interesting development in surgical advances which provided the groundwork for future medical innovations. However, reflecting on unconventional yet innovative procedures such as heart transplants, modern observations suggest that for an organ transplant to be considered ethical then the policies about organ procurement should not ignore either the vital needs of the recipients or the dignity and interests of the donors. This is an acknowledgement that was also recognised before and immediately after the heart transplant's debut in 1967.<sup>13</sup> Concerned with the ethics of donor/recipient safeguarding and the intricacies of the procedure itself, contemporary physicians and transplant surgeons realised that they had to also destroy any debatable perceptions that the public may have about surgeons and their self-indulgent nature to ravenously snatch organs from helpless victims.<sup>14</sup> This selfish nature is highlighted in contemporary newspapers where tabloids, such as *The Times*, imply that heart transplants have become a point of national rivalry, one that defies the Hippocratic approach<sup>15</sup> which Western medicine is built upon.<sup>16</sup> Furthermore, the heart transplant was regarded as an unworkable procedure because of its uncertain prospects. The operation still had the label 'palliative'<sup>17</sup> and because of the huge risks that shadowed this procedure, controversies lingered around whether they should be proliferated and normalised.<sup>18</sup> A strong realisation that supports the anti-heart transplant notion is that despite the procedure's initial success, criticism for this operation began to surface when the public realised that transplant surgeons

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<sup>12</sup> Macdonald, H., 'Considering Death', p.501

<sup>13</sup> Bagheri, A., 'individual choice in the definition of death', *J Med Ethics*, 33(3) (2007)

<sup>14</sup> Lock, M., *Twice Dead*, p.79

<sup>15</sup> The Hippocratic Oath is an oath taken by physicians. It ensures that their actions meet the standard ethics and that doctors conduct their work properly to ensure that patients receive the correct treatment.

<sup>16</sup> Our Medical Correspondent, 'British heart transplant may be too early', *The Times*, Issue: 57243, May 4<sup>th</sup>, 1968.

<sup>17</sup> In this context, a palliative relieves suffering without treating the cause of the suffering. The heart transplant was initially regarded as a palliative because its success was not ensured.

<sup>18</sup> Prince, J., 'Call for brake on heart transplants', *The Daily Telegraph*, Issue: 35199, 27<sup>th</sup> June 1968

could not always control organ rejection.<sup>19</sup> This was a valid argument as rejection served as the biggest killer in heart transplant victims. However, Lord Morris writing in *The Times* in 1969, believed that to withdraw from performing heart transplants because of the fear of rejection and other issues reflected a defeatist attitude, one that did not complement the revolutionary medical understandings stemming from Barnard and his team.<sup>20</sup> Morris believed that the success presented by Barnard's second heart transplant victim, Dr Blaiberg, who lived on for eighteen months post-operation, served as a triumphant leap into a complex field and that it would be disreputable to halt this approach indefinitely due to fears of the unknown and other prejudices. This contemporary proposal is supported by experts David Cooper and Denton Cooley<sup>21</sup> who reframe that considering the unexplored area of immunosuppressive therapy and a surgical team's inexperience in treating and diagnosing tissue rejection, Barnard's second transplant served as a framework to support explorations into the field of heart transplants and preserve its legitimacy.<sup>22</sup>

Revolutionary advances in medicine witnessed in the late 1960s added pressure to creating a new definition of death; one that reflected medical innovations and understandings. The traditional criteria of cardiopulmonary-related death were no longer compatible with situations created by medical equipment that could now be used to reverse conventional means of death, and as Hershenov has implied, individuals who would have been considered dead in another era [were] now sometimes 'returnable.'<sup>23</sup> The ground-breaking impact of Barnard's procedure, partnered with the advances in medical technologies created a desire to protect the procedure's long-term prospects. As heart transplants were now recognised as a practical option for treating patients with heart failure, the need to redefine death was imperative to organ transplant advocates as the heart and lungs could now be regulated artificially. So, not only did that make the traditional concept of death obsolete but it also created an urgency to reconsider existing medical terminologies.

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<sup>19</sup> Daily Telegraph Reporter, 'Surgeon attacks "prestige heart transplants"', *The Daily Telegraph*, Issue: 35746, 3<sup>rd</sup> April 1970

<sup>20</sup> Morris, L., 'Heart Transplants', *The Times*, Issue: 57643, 20<sup>th</sup> August 1969

<sup>21</sup> David Cooper is an expert in surgical transplantations, serving as a surgeon-scientist until now where he is predominantly involved in the research of xenotransplantation (cross-species). Denton Cooley was a contemporary American surgeon who, along with Barnard, led some of the ground-breaking medical innovations in transplantations. He was also present at the Cape Town Symposium of 1968 along with other contemporary experts in the medical field.

<sup>22</sup> Morris, L., 'Heart Transplants', *The Times*, Issue: 57643, 20<sup>th</sup> August 1969. See Also: Cooper, D. K. C., Cooley, D. A., 'Christiaan Neethling Barnard, 1922-2001', vol.104, No.23.

<sup>23</sup> Hershenov D. The problematic role of "irreversibility" in the definition of death. *Bioethics*. 2003;17(1):89-100. Cited in: Parent, B. & Turi, A., 'Death's troubled relationship with the law', *Illuminating the Art of Medicine* (December 2020) p.1055. See also: Kerrigan, M., *The History of Death* (London: Amber Books Ltd 2017) p.12

Professor of Social Medicine David Rothman acknowledged that once surgeons had ‘transplanted a beating heart and the feat was celebrated in the media – the need to redefine death was readily apparent.’<sup>24</sup> As the concept of death had now been thrown into question by transplant surgeons, waiting for heart stoppage was now surgically unacceptable. Transplant surgeons believed that waiting for the cessation of a heart to pronounce death was now medically unethical; especially with the new technologies and understandings in this field.<sup>25</sup>

However, whilst convincing suggestions were made about what constitutes death by heart transplant supporters, obtaining the appropriate number of donors for recipients remained challenging. This is why the meaning of death had to be carefully reassessed to gain support for transplant surgery and increase the number of people willing to donate their organs if they entered a state from which they were to be unable to recover. Desmond Smith argued that ‘as the need for donors grow larger, the definition of death must be carefully redefined. When are you dead enough to be deprived of your heart?’<sup>26</sup> These socio-medical and ethical questions about heart transplants were the primary motivation behind the Symposium in 1968. At this event, leading surgeons across the globe came together to discuss how their interpretations in this medical discipline could enhance progress and provide a new method of treating those with serious heart issues; also, extinguishing any critical declarations which may completely stop or halt the process of maintaining heart transplants.

Whilst heart transplants dramatically proliferated in the late 1960s, it was the success derived from Barnard’s patients that proved the most ground-breaking. Barnard’s first patient died eighteen days post-surgery and his second patient lived for a staggering eighteen months post-operation; it is the latter case which is regarded as the cornerstone of securing the future of heart transplants.<sup>27</sup> It was this type of success which helped to re-conceptualise the idea of death, making the topic a sensitive delineation between defining death as the cessation of brain functions or circulatory/respiratory functions.<sup>28</sup> However, whilst the surgery’s success did encourage the idea that the practicality of heart transplants should be taken seriously, a popular reason to reject this operation was the lack of long-term solutions

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<sup>24</sup> Rothman, *Strangers at the Bedside* (n.3) p.160. Cited in, Macdonald, H., ‘Considering Death’, p.503

<sup>25</sup> Idea from: Roper, J., ‘Transplants “should be allowed while heart still beating”’, *The Times*, Issue: 59308, 31<sup>st</sup> January 1975. See similar ideas in: Our Medical Correspondent, ‘Cardiology: Transplants assessed’, *The Times*, Issue: 59861, 15th November 1976

<sup>26</sup> Smith, D., ‘The Heart Market: Someone Playing God’, *Nation*, 1968, P.721. Cited in: Lock, M., *Twice Dead*, p.85

<sup>27</sup> Hoffenberg, R., ‘Christiaan Barnard’, p.1478

<sup>28</sup> Ave, A. D., Shaw, D., Bernat, J., ‘Defining Death in Donation’, p.117



that it offered. Opinions and feelings in the post-Barnard era can be witnessed in examples such as John Roper's article where he uses the idea that:

occasional dramatized success should not oblige the health service to try to meet the disproportionate demands of surgical enthusiasts for scarce medical, technical, and nursing resources implicit in a premature attempt to establish cardiac transplantation as a practicable form of treatment before the basic scientific problems concerned have been brought nearer to solution.<sup>29</sup>

The experimentations in this field were unorthodox and although contemporary professionals and non-professionals were concerned about the feasibility of the transplant and the self-interests of transplant surgeons, these types of claims inspired the symposium of 1968. Arguably, to think rationally during this period would be to discourage heart transplants temporarily due to the social and medical complexities that it entailed. Contrastingly, transplant surgeons had already descended into the realms of cardiac transplantation and as Christiaan Barnard suggested, the 'first step' into this field has already been taken and it would, in his view, have been wrong for the patient, humanity, and the common purpose to turn back.<sup>30</sup>

The definition of death remained ambivalent because medicine was developing at a rate that many non-professionals and even professionals could not fully comprehend. However, in the context of heart transplants, the 'dead-donor rule' played a central role when justifying the procedure in a legitimately ethical manner.<sup>31</sup> As certain biological functions were now able to be maintained in brain-dead patients, surgical advocates in this field thought it was necessary to amend the meaning of death because of the medical innovations that were now present.<sup>32</sup> This desire to reinvigorate the definition of death was acknowledged by professionals at the Symposium. Dr A. P. Rose-Innes declared that 'if we use the conventional point of death only, time is impossibly short for proper preparation for the surgery.' This acknowledgement is mirrored by Dr. de Villiers<sup>33</sup> who applies the re-visited definition of death to the application of donors by stating that, 'it must be reasonable to state that only those patients with severe, irrecoverable brain damage who cannot maintain their respiratory function independently, should be regarded as suitable candidates for providing

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<sup>29</sup> Roper, J., 'Heart transplants "need more research"', *The Times*, Issue: 57455, 10<sup>th</sup> January 1969

<sup>30</sup> Roper, J., 'I give extra life Barnard says', *The Times*, Issue: 57687, 10<sup>th</sup> October 1969

<sup>31</sup> See: Sarbey, B., 'Definitions of death: brain death and what matters in a person', p.751

<sup>32</sup> Birnbacher, D., 'Determining Brain Death: Controversies and Pragmatic Solutions', in Lena Hansen, S., Schicktanz, S. (Eds.) *Ethical Challenges of Organ Transplantation*, p.103-105

<sup>33</sup> Jacques Charl (Kay) de Villiers was a leading South African neurosurgeon emeritus professor of neurosurgery at the University of Cape Town. He was also present at the Cape Town Symposium in 1968.

tissues for transplantation.<sup>34</sup> These observations show the importance of a re-evaluated definition of death and its instrumentality in securing the future of heart transplantation. The importance of this change of criteria is fundamental to the procedure as it ensures that a beating heart can be extracted from a brain-dead patient without any controversy surrounding the state of the donor. According to Professor Adrian Kantrowitz<sup>35</sup>, ‘experimentally, it can be shown if one takes a beating canine heart, that the chances of immediate success are much higher. If one waits until the heart has stopped, one can resuscitate such a heart, but it does not perform as well as the heart removed still beating.’ He concludes this observation by stating that ‘the point at which the potential donor becomes a donor is essentially the point of irreversible brain death, as diagnosed by the experts.’<sup>36</sup> Whilst the steps taken to perform a heart transplant were widely considered unethical and unorthodox during this period, declarations like Kantrowitz’s imply that with the wide range of medical innovations and capabilities that are now present in the medical industry at the end of the 1960s, it is now inhumane and unethical not to change traditional criteria’s as these conventional methods are now outdated. A similar point to Kantrowitz was displayed by contemporary surgeon Professor Norman Shumway who believed that the heart must be in perfect condition before it is extracted from the donor and placed into the recipient.<sup>37</sup> The use of artificial interventions, such as the ventilator, would help preserve the heart before it is extracted for transplantation purposes; ensuring that the organ is not weakened due to any deprivation of its functions. It salvaged life while also identifying who now became unsalvageable by medicine.<sup>38</sup>

Cardiac transplantation was now gaining a profile that helped the procedure become ‘normalised’ within everyday medical practice and discipline. The focus on death acting as a process rather than an event is a popular initiative that helped professionals reconsider their ideological stance. As emphasised by Professor Kantrowitz, ‘death is a process just as life is, and there are organs and tissues which die very quickly. If you deprive the brain of oxygenated blood for 3,4 or 5 minutes, it is irreversibly dead.’<sup>39</sup> Displaying death as a

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<sup>34</sup> Shaprio, H. A. (Eds.) *Experience with Human Heart Transplantation: Proceedings of the Cape Town Symposium 13-16 July 1968*, (Durban: Butterworth & Co. 1969) p.38 & 39.

<sup>35</sup> Adrian Kantrowitz was an American cardiac surgeon and performed the first human heart transplant in the United States, three days after Christian Barnard performed the world’s first human such operation in December 1967

<sup>36</sup> Shaprio, H. A. (Eds.) *Experience with Human Heart*, p.41. See also: Loshak, D., ‘Brain Death is key’, *The Daily Telegraph*, Issue: 37228, February 1, 1975. See also: Lock, M., *Twice Dead*, p.89

<sup>37</sup> Science Report, ‘Cardiology: Survival after transplants’, *The Times*, Issue: 59057, 5<sup>th</sup> April 1974

<sup>38</sup> Belkin, G., *Death Before Dying: History, Medicine, and Brain Death*, (Oxford University Press 2014) p.53

<sup>39</sup> Shaprio, Hillel A. (Eds.) *Experience with Human Heart*, p.49

phenomenon that develops over time reflects an idea stressed by philosopher Baruch A. Brody. Brody emphasises that the search for a definition/criterion made sense when these points were always close in time to each other because medicine could not protect some of the functions when others had stopped. However, this was no longer relevant as medicine was now capable of maintaining key bodily functions for longer periods.<sup>40</sup> The socio-medical attitudes towards death in the 1960s and 1970s reflect a 'renaissance-like' development in the medical discipline. These ideologies are also witnessed as early as 1915 in an account of a surgeon from Chicago who justified his euthanasia practices through a brain-based concept of life. He asserted that 'we live through our brains... Those who have no brains, their blank and awful existence cannot be called life.'<sup>41</sup> This example portrays early implementations of brain death policies. It can also suggest a framework upon which surgeons, physicians and philosophers of the following decades had built their ideology.

The evolving theories around what constitutes death were evident in the 'President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioural Research' report on a 'total brain' standardised definition of death, which was published in the early 1980s. The report noted that 'the traditional "vital signs" of heartbeat and respiration were merely surrogate signs with no significance in themselves. On this view, the heart and lungs are not important as basic prerequisites to continued life but rather because the irreversible cessation of their functions shows that the brain had ceased functioning.'<sup>42</sup> This acknowledgement shows how the traditional approaches to death were no longer applicable and how innovative medical machinery had helped enhance the idea of quickly adopting a modernised style that reflected significant breakthroughs in surgery.

The heart transplant and its public impact on medicine was single-handedly responsible for an immediate desire to reconsider ideas about death. A surgery that required unorthodox steps to be taken to treat terminally ill patients with heart diseases created the foundations of evaluating death in the context of contemporary medical advances.

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<sup>40</sup> Brody, B. A., 'How much of the Brain must be dead?', in Youngner, S. J., Arnold, R. M., Schapiro, R. (Eds.) *The Definition of Death: Contemporary Controversies*, (Baltimore and London: John Hopkins University Press, 1999) p.79

<sup>41</sup> Pernick, M., *The Black Stork* (New York: Oxford University Press, 1996) Cited in: Pernick, M. S., 'Brain Death in a Cultural Context', in Youngner, S. J., Arnold, R. M., Schapiro, R. (Eds.) *The Definition of Death*, p.7

<sup>42</sup> Sarbey, B., 'Definitions of death', P.746

## The Concept of Brain Death and its Fundamental Ambiguity

The concept of death is a field of study with many grey areas, meaning that a concrete definition has not yet been achieved. Death's ambiguity creates subjective interpretations amongst physicians, transplant surgeons, scholars, and the public. However, scholars tend to analyse the concept of death by attempting to agree on its definition, and then formulate a measurable, appropriate criterion to show that the definition has been fulfilled, resulting in a series of tests to prove that the criterion for death has been reached.<sup>43</sup>

Before attempting to define the topic of death, it must first be acknowledged that a definition and a criterion are two separate entities. A definition portrays the conditions that must be met for a thing or event to answer a certain description, and it is these conditions which must be precise before one can decide which criterion best reflects that these conditions are being achieved.<sup>44</sup> In the pursuit of applying brain death as a suitable way of defining death, Robert Veatch implies that death should be understood in the relevant context when defining brain death. He suggests that the question of using the brain death criterion as a valid method for death seeks to specify the signs that indicate the relevant definition of death has been met.<sup>45</sup> Adopting this acknowledgement is important as it is a useful method to apply when attempting to resolve a difficult subject like defining death. It does not offer an impervious definition, but it does offer a method that will provide a meaning of death in response to evolving medical developments. Whilst a definition is not concrete, it is widely acknowledged that when we use a definition of death referenced by a criterion, then this is a priori matter for which empirical evidence is not directly needed or exactly relevant when determining one's demise.<sup>46</sup>

In September 1968, the 'Ad Hoc Committee of Harvard Medical School to Examine the Definition of Brain Death', led by Henry Beecher, produced a report in the Journal of the American Medical Association under the title 'A definition of irreversible Coma.' This publication put forth a criterion involving a permanently non-functioning brain for the purpose

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<sup>43</sup> Bernat, J. L., Culver C. M., Gert B., 'On the definition and criterion of death', *Ann Intern Med* 1981; 94: 389-394. Cited in Bernat, James L., 'Refinements in the Definition of and Criterion of Death', in Youngner, S. J., Arnold, R. M., Schapiro, R. (Eds.) *The Definition of Death: Contemporary Controversies*, (Baltimore and London: John Hopkins University Press, 1999) p.83

<sup>44</sup> Idea from: Birnbacher, D., 'Determining Brain Death', p.104

<sup>45</sup> Veatch, R., *Death, Dying and the Biological Revolution* (New Haven/London: Yale University Press 1989) Cited in Birnbacher, D., 'Determining Brain Death', p.104

<sup>46</sup> Birnbacher, D., 'Determining Brain Death', p.104/105

of achieving a precise definition of death called 'irreversible coma'.<sup>47</sup> It was generally agreed that as heart transplants increased their social presence, it was essential to the longevity of this operation that the medical community was to be given some agency when revisiting death's definition.<sup>48</sup> Whilst the concept of brain death was being integrated into conscious thought amongst professionals and non-professionals and eventually into legislation, this only created more ambiguity regarding brain-orientated definitions. Although the original focus was on a 'total' brain death which refers to the death of the entire brain, as neurology now served as a centre-point of labelling death, questions were raised about what areas of the brain were considered important and whether an individual is only dead when the last remaining function in the brain ceases. This opened a different avenue of brain-orientated death, one that related to higher brain functions. As it was suggested that the cerebrum is the area of the brain that performs higher-standard functions like interpreting touch, vision, hearing, speech, reasoning, emotions, learning, and control of movement, the cessation of this area was referred to as the determinant of death based on a higher standard of brain death.<sup>49</sup> As Robert Veatch explained, 'higher brain death' holds that the key functions of the brain such as memory, consciousness, and personality are what make us a person and since those functions stem from the cerebral areas of the brain, it is the cessation of these portions of the brain that should be considered equal to the death of a person.<sup>50</sup> These important features of human function were echoed in 1971 when Scottish neurologist J.B. Brierley urged that brain death should solely be associated with the permanent cessation of higher functions rather than the complete loss of all brain functions. He stated that death should relate to the cessation of 'those functions of the nervous system that demarcate man from the lower primates.'<sup>51</sup> Innovations were now being made within the brain-oriented environment which did not make the matter of defining death any clearer than it was under the criteria of the cardiopulmonary standard. Nevertheless, these are important developments in the field of death as new theories about human cessation were evolving simultaneously with the expansion of medical capabilities and understanding.

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<sup>47</sup> Sarbey, B., 'Definitions of death', p.744. See also: Hoffenberg, R., 'Christiaan Barnard', p.1480. Also, Faulkner, A., 'Brain Death Ruling in U.S.', *The Daily Telegraph*, Issue: 35233, August 6, 1968. See Also, Lock, M., *Twice Dead*, p.90

<sup>48</sup> Idea from Faulkner, A., 'Brain Death Ruling in U.S.', *The Daily Telegraph*, Issue: 35233, August 6, 1968

<sup>49</sup> Sarbey, B., 'Definitions of death', p.745.

<sup>50</sup> Veatch, R., *The Whole-Brain-Oriented Concept of Death: An Outmoded Philosophical Formulation*. Cited in: Sarbey, B., 'Definitions of death', p. 747.

<sup>51</sup> Pernick, M. S., 'Brain Death in a Cultural Context', p.12

The Committee was very influential during this period and reiterated many of the contemporary beliefs of those who supported brain death as a discipline. The Committee was a very important presence during this time as they gave legitimacy to the abstract concept of brain death which before Barnard's success would have been unimaginable. Henry Beecher favoured brain-based criteria, but his priorities were not set on resolving the meaning of death. Rather, he advocated a neurological stance to solve practical problems that he attributed to new technologies, particularly organ transplantation, heart-lung machines, and ventilators.<sup>52</sup> He hoped that the criteria displayed by the Harvard Committee would not only increase the number of donors but also defend the entire medical profession against public prosecution and accusations that would label these medical professionals as 'organ thieves' or 'killers.' Although at this period many ideas around securing the future of heart transplants and obtaining large amounts of donors were unethical, Beecher was trying to evolve the 'normal' boundaries of death, parallel to the increasing medical changes. It can be suggested that as time and investment were placed into the heart transplant and the concept of brain death, the principles and procedures that encapsulate these disciplines could eventually be considered ethical and morally objective.<sup>53</sup> William Curran, a member of the Harvard Committee resonated with some of Beecher's ideas by explaining that if the whole-brain criteria became the standard of medical practice, then the law would protect physicians who followed the criteria from any malpractice charges, particularly in the context of organ donation.<sup>54</sup> The Committee's obligation to a total brain death criteria is explored by historian Karen Gervais who suggests that Beecher [and his team] may have held this belief because there were no higher-brain criteria suggested at this point and not just because he held a whole-brain definition of life.<sup>55</sup> Whilst brain death provided a popular alternative to the traditional definition of death relating to the stoppage of the cardiopulmonary system, the introduction of brain death which filtered into contemporary professional discussions would evolve as further concentration was focused on understanding the cessation of certain brain functions and their overall importance when contributing to death's process.

Before theories of brain death began to encapsulate both public and professional discourse, it was socially and legally accepted that death consisted of a 'total stoppage of

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<sup>52</sup> Pernick, M. S., 'Brain Death in a Cultural Context', p.9

<sup>53</sup> Idea from: Beecher, H. K., 'Ethical Problems Created by the Hopeless Unconscious Patient', *New England Journal of Medicine*, 278 (June 27<sup>th</sup>, 1968) p.1427, cited in: Pernick, M. S., 'Brain Death in a Cultural Context', p.9

<sup>54</sup> *Journal of the Medical Association*, June 27<sup>th</sup> 1968, p.1426-29. Cited in: Pernick, M. S., 'Brain Death in a Cultural Context', p.13

<sup>55</sup> Grandstrand Gervais, K., *Redefining Death* (New Haven: Yale University Press, 1986) p.13 cited in: Pernick, M. S., 'Brain Death in a Cultural Context', p.12

the circulation of the blood, and a cessation of the animal and vital functions consequent thereupon, such as respiration, pulsation, etc.’<sup>56</sup> These different theories all sought to emphasise which areas of the brain are necessary for determining irreversibility. However, the term ‘irreversibility’ which was used by the Harvard Committee in 1968 to identify the death of the brain is perceived as problematic by neurologist James L. Bernat. To accommodate medical theories and practices with the law, he believed that irreversibility, which means a function that has stopped and cannot be restarted, should be replaced with permanence. This is because the definition of permanence in the relevant context of brain death specifies that a function has stopped, will not restart on its own, and no such intervention will be undertaken to restart it.<sup>57</sup> However, this replacement idea has been criticised by theorists such as RD Truog and FG Miller who have suggested that replacing the term irreversibility with the permanence standard is just ‘gerrymandering the definition of death.’<sup>58</sup> Even though these criticisms may be true to a degree, this example shows just how intricate the study of neurology is in the context of death, and how unexplored and subjective the field of death remains; despite multiple attempts by different theorists to provide a definitive measure of mortality.

Although the Harvard Committee had put forth the idea of whole-brain criteria for defining death consisting of the permanent loss of all brain functions from consciousness to primitive brainstem reflexes<sup>59</sup>, the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioural Research presented the ‘total brain’ standard to incorporate this theory into state legislation. This is because it addressed the advances in medicine and technology which could now perform necessary bodily functions. Although the President’s Commission did not have the legal authority to change legislation and purely acted as an advisory group to the President on bioethical issues, the presence of this organisation in 1981 shows how the policy of brain death had infiltrated its way into legal matters; originating from the period which witnessed Barnard’s first heart transplant in 1967,

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<sup>56</sup> Macdonald, H., ‘Considering Death’, p.501

<sup>57</sup> Idea from Bernat, J. L., ‘Point: Are Donors After Circulatory Death Really Dead, and Does It Matter? Yes and Yes’, *Chest Journal*, vol.138, Issue 1. (2010) p.13-16. See also: Parent, B., Turi, A., ‘Death’s troubled relationship with the law’, *Illuminating the Art of Medicine* (December 2020) Available Online: <https://journalofethics.ama-assn.org/article/deaths-troubled-relationship-law/2020-12> Accessed on: 03/10/22. Similar ideas mentioned in: Ave, A. D., Shaw, D., Bernat, J., ‘Defining Death in Donation after Circulatory Determination of Death’, in (eds.) Lena Hansen, S., Schicktanz, S., *Ethical Challenges of Organ Transplantation*, p. 119

<sup>58</sup> Truog R. D., Miller F. G., ‘The dead donor rule and organ transplantation’, *N Engl J Med*. 2008;359(7):674-675. Cited in: Parent, Brendan & Turi, Angela, ‘Death’s troubled relationship with the law’.

<sup>59</sup> ‘A Definition of Irreversible Coma’, *Journal of the American Medical Association* 205 (1968) p.337-340. Cited in: Pernick, M. S., ‘Brain Death in a Cultural Context’, p.8

and the Harvard Committee's report in 1968.<sup>60</sup> However, another theory of brain death that became popular during this attempt to inaugurate the total-brain standard by the President's Commission is the 'higher-brain standard', and while competing with the total standard, the death of the entire brain is sufficient enough for labelling brain death but not entirely necessary under the policies of this new discipline.<sup>61</sup> While total brain death may not be entirely necessary for death, it is applicable in the sense that all cases of total brain death are by default cases of death and in practical purposes, cases of total brain death can be referred to as cases of death by anyone holding a brain-based standard of mortality. This is because every case of total brain death would automatically be a case of higher brain death, meaning that both standards have been met.<sup>62</sup> This could be one of the many reasons why a total brain standard was legally accepted and not based on the cessation of higher functions; making the total standard a more politically pragmatic way of separating the state of being alive and dead. The case of total brain death was made stronger by the President's Commission which attempted to debunk declarations of higher-brain-oriented death. They argued that these definitions which focused on the higher-end functions were too radical, too subjective, and impossible to carry out under the current climate of medical development as no operational criteria existed for supporting these theories.<sup>63</sup>

In response to these proposed definitions of brain death, arguments have arisen that use scientific findings and logic to either support or denounce brain death theories. Two popular theories that attempt to explain brain death are the Thermodynamics Theory and the Holistic Integration Argument. The first theory is employed by Jules Korein who emphasises that parallel to a brain being destroyed, the organism's critical system has been destroyed and with the destruction of this system, spontaneous fluctuations will irreversibly cause the organism to deteriorate and increase systematic entropy until all functions are unable to operate. He further declares that it is the beginning of this process where certain brain functions are lost that are responsible for the critical functions of the organism.<sup>64</sup> A similar theory supporting brain death is the Holistic Integration Theory which declares that in the event of an individual who possesses complete, irreversible, and irrecoverable loss of brain

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<sup>60</sup> Idea from The President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioural Research *Defining Death: Medical, Legal, and Ethical Issues in the Determination of Death*. (1981) Cited in: Sarbey, B., 'Definitions of death'. See also: Hoffenberg, Raymond, 'Christiaan Barnard', p.1480

<sup>61</sup> Sarbey, B., 'Definitions of death', p.748

<sup>62</sup> Sarbey, B., 'Definitions of death', p.745

<sup>63</sup> Presidents Commission, *Defining Death*, 38-41, cited in: Pernick, M. S., 'Brain Death in a Cultural Context', p.19. See also: Sarbey, Ben, 'Definitions of death', p.745.

<sup>64</sup> Bernat, J. L., 'Refinements in the Definition of and Criterion of Death', p.86-87



functions, the organism has lost its central control organ and it is this centre where all different parts and functions of the body are monitored and controlled. However, this theory has been analysed in Dieter Birnbacher's article where he suggests that if this argument is understood to mean that the brain is strictly responsible for the control of every bodily function, then this is inaccurate when we consider the capacity of bodily functions to remain intact with artificial support, such as a ventilator for up to several months. However, if this theory is interpreted in the spiritual sense that someone who is deprived of vital brain functions is no longer a 'complete' individual, then this adds substance to medical debates as it is true that a human without key functions of the brain can hardly be considered complete in the context of ordinary and necessary elements of life.<sup>65</sup> This interpretation of similar theories is compatible with both the total and higher standard of brain death as they both imply that the brain is what matters in the determination of death; whilst attempting to delineate between the areas of the brain that are responsible for functions which are considered both natural and essential to one's existence. This acknowledgement is consistent with ideas announced by specialists in this field such as Charles Culver, Bernard Gert, and James Bernat who all conclude that whilst removing life support from someone in a persistent vegetative state (PVS) is controversial, the answer should not be reached by deliberately ignoring the important distinction between death and loss of personhood.<sup>66</sup> Whilst this theory does mention acknowledging the distinction between death and loss of personhood, it is not completely dismissive of the fact that the loss of personhood is irrelevant and although it is a psychological and spiritual concept that can only die in a metaphorical sense, it is this realisation that places a sense of consideration to the idea of a person irreversibly losing their individual identity. This observation serves as another paradigm which reflects the ambiguity of death and how despite scholarly attempts to reach some form of clarity and coherent conclusion, it ultimately complicates matters further; emphasising that the realities of death rely on subjectivity and interpretation rather than objective information.

Deciding on an appropriate definition for death is difficult and the available testing to support these brain-based theories shares the same problems. As the field of neurology is so vast and largely unexplored, using an adequate test that best reflects some of the proposed theories of brain-oriented death remains controversial with professionals all struggling to create a perfect solution. The Quality Standards Subcommittee of the American Academy of Neurology suggested a criterion that was compatible with the evolution of

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<sup>65</sup> Birnbacher, D., 'Determining Brain Death', p.107

<sup>66</sup> Bernat, J. L., Culver C. M., Gert B., 'On the definition and criterion of death', *Ann Intern Med* 1981; 94: 391. Cited in: Bernat, J. L., 'Refinements in the Definition of and Criterion of Death', p.89

medical capabilities to identify the occurrence of brain death. They had stressed that if a patient was not being maintained by a ventilator then it would be necessary to identify the individual's death with the prolonged loss of circulatory and respiratory functions; however, if the patient was maintained on a ventilator then it would be appropriate to use the criterion of measuring for prolonged cessation of measurable clinical functions of the whole brain.<sup>67</sup> These innovative adaptations can reflect Barnard's theories expressed at the Symposium around the extraction of beating hearts. He implied that if you removed a respirator away from a patient to see if they can breathe independently as part of the tests to determine someone's death based on their inability to breathe autonomously, then is it necessary to wait for the beating heart to stop beating before it can be extracted?<sup>68</sup> Drawing parallels between Barnard's observation and the methods displayed by the Subcommittee, we can see a continuation in medical discipline first proposed by Barnard in 1968 and by the Subcommittee in 1995. This is apparent through the realisation that the use of artificial machinery has become obligatory for someone in a critical state, and because of this, the criteria for brain death have become the closest resemblance to measuring someone's mortal state; in a scenario where irreversible cessation has occurred and recovery is not an option due to the irreparable damage of the brain, and the artificial inability to reverse the occurrence.

Although specialists debate which definition best reflects the state of death, most medical experts suggest that the diagnosis of brain death should be confirmed by tests showing that none of the vital centres in the brain stem is still functioning, repeating this test frequently to enhance its validity. In addition, most imply that the presence of an Electroencephalogram (EEG) is not required because although it is used to monitor brain activity, this machine can track even the minutest bit of brain activity which could interfere with the determination of death when applying brain death ideology. So, brain-oriented advocates, either of the higher, total, or brainstem standards, would not want an EEG present as it could tamper with results.<sup>69</sup> Despite these implications present when testing for brain death, Christopher Pallis has observed that bedside tests for brain death that are performed by physicians rarely assess the functions of large portions of the brain such as the occipital lobes, basal ganglia, and the thalamus. He portrays that determination of whole brain death

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<sup>67</sup> The Quality Standards Subcommittee of the American Academy of Neurology. Practice Parameters for determining brain death in adults. *Neurology* 1995;45: 1012-1014. Cited in: Bernat, J. L., 'Refinements in the Definition of and Criterion of Death', p.85-86.

<sup>68</sup> Shaprio, H. A. (Eds) *Experience with Human Heart Transplantation*, p.51

<sup>69</sup> Idea from: Smith, T., 'Whose hand on the life switch?', *The Times*, Issue: 59860, 13<sup>th</sup> November 1976. See also: By Our Health Services Correspondent, 'Doctors back brain death concept', *The Daily Telegraph*, Issue: 37240, 15<sup>th</sup> February 1975cy

focuses on assessing brainstem functions, presumably because they're much easier to test for than other 'higher brain' functions, their exact location within the brain, and concluding their complete cessation.<sup>70</sup> However, Veatch implies that while a criterion that solely accepts the higher-brain notions of death is unlikely to occur in the immediate future, he suggests that the 'old-fashioned' view of the total brain standard is becoming less and less popular as more people begin to realise that not all brain functions must be permanently lost to classify an individual as dead.<sup>71</sup> The desire to reach a completely coherent conclusion about brain death is a natural by-product of ever-evolving ideas and innovations. Its primary focus is to receive a good reception from the public as it plays a key part in the continuation and preservation of both brain death legislation and heart transplants. These issues were contemporarily reported on at the symposium by professionals such as Dr Pierre Grondin<sup>72</sup> who states that 'even though it is very difficult to define the point of no return, or to find some definition of brain death, I think it is important because the public is worried about one thing and that is that we are going to use donors who could be restored.' The approach taken here shares many similarities with theorists such as Veatch who seek to preserve their ideology practically. Grondin echoes many of the contemporary understandings about the preservation of heart transplants and the importance of brain death by concluding that experts in this field must attempt to define death to the best of their abilities as this is essential to the preservation of human heart transplants; otherwise, the public would always remain critical of this procedure and those performing it.<sup>73</sup> Tests must be carried out with clarity and authenticity because if a test fails to present any of the key features consistent with brain death, then this standard cannot be diagnosed and certified due to its inability to meet the correct criteria.<sup>74</sup>

For as long as humans have questioned the concept of death, the heart has always acted as the spiritual and biological headquarters of an individual. However, with a proliferation of surgical developments and advanced medical knowledge, the focus on the heart has been replaced with an increase in concern about the brain and its functions. The

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<sup>70</sup> Pallis C., *ABC of Brainstem Death* (London: British Medical Journal, 1983) Cited in: Bernat, J. L., 'Refinements in the Definition', p.87. See similar ideas in: Pallis, C., 'The Criteria for diagnosing death', *The Times*, Issue: 59568, 3<sup>rd</sup> December 1975

<sup>71</sup> Veatch, R. M., 'The Impending Collapse of the Whole-Brain Definition of Death', *The Hastings Centre Report*, Vol.23, No.4 (1993) p.24

<sup>72</sup> Dr. Pierre Rene Grondin was a Canadian cardiac surgeon and is remembered for his efforts in the cardiac field. He was also one of the first doctors to successfully perform a successful human-to-human heart transplant.

<sup>73</sup> Ed., Shaprio, H. A., *Experience with Human Heart Transplantation*, p.48-49

<sup>74</sup> Idea from: Golia, A. K. & Pawar, Mridula P., 'The Diagnosis of brain death', *Indian J Crit Care Med*, 13(1) (2009) Available online: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2772257/> Accessed on: 06/10/22

innovation in surgical equipment and the use of artificial machinery presented the idea that the heart, which was once thought to possess almost mystical qualities, could now be maintained through artificial intervention. Leading professionals such as Boston neuroscientist Robert Schwab argue the traditional narrative of the heart and suggest that 'the human spirit is the product of a man's brain, not his heart.'<sup>75</sup> Whilst this transition is noted by many professionals and scholars in the field as dramatic, Alex Capron, the executive director of the President's Commission, suggested that a move from a definition based on a standard of cardiopulmonary cessation to a brain-based standard was not radical at all; rather, it reflected the recognition and acceptance of new diagnostic measures and equipment that were both not available before and no longer compatible with traditional disciplines.<sup>76</sup> According to Capron and the Commission's 'Defining Death Report', the evolving disciplines and attitudes toward brain death are merely a surrogate that reflects the advanced capabilities of both surgeons and medical equipment and does not highlight a drastic alteration from the traditional narrative of death but instead, offer an innovated alternative approach.<sup>77</sup>

However, whilst these modern ideas and developments have led many to question the occurrence of death in a medical context, it has also created an inquisitive field where professionals and non-professionals have suggested the importance of them as individuals and what components are imperative to natural and ordinary life. These acknowledgements favour the importance of spiritual components, although they do not disregard the biological structure and significance of an individual.<sup>78</sup> The two main theories that reflect these ideas around the spiritual significance of an individual are the Identity Theory and the Functionalist Theory. Firstly, the Identity Theory suggests that 'states and processes of the mind are identical to states and processes of the brain'.<sup>79</sup> If we take this acknowledgement and apply Jeff McMahan's idea that 'each of us is essentially a mind'<sup>80</sup>, and our minds are indistinguishable from our brains, then the death of the brain will result in the death of the mind; therefore, the death of the whole person. This theory has been used to add support to some of the brain-oriented standards such as the total and higher disciplines of brain death.

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<sup>75</sup> (Time 1966 Thanatology. May 27) Cited in: Lock, M., *Twice Dead*, p.92

<sup>76</sup> Veatch, R. M., 'The Impending Collapse of the Whole-Brain', p.19

<sup>77</sup> President's Commission (1981) p.59, cited in: Sarbey, B., 'Definitions of Death', p.750

<sup>78</sup> Idea from: Sarbey, B., 'Definitions of death'.

<sup>79</sup> J.J.C. Smart, 'The Mind/Brain Identity Theory', *Stanford Encyclopedia of Philosophy Archive* (2014) Available online: <https://plato.stanford.edu/archives/win2014/entries/mind-identity/> Accessed on: 10/01/23. See also, Sarbey, B., 'Definitions of Death', p.748

<sup>80</sup> McMahan, J., *The Metaphysics of Brain Death*, 9 *Bioethics* 91, 102 (1995) Cited in: Sarbey, Ben, 'Definitions of Death', p.748

This is because the cessation of the cerebral hemispheres will be sufficient for the death of an individual and it is these parts which are believed to constitute the mind and its function.<sup>81</sup>

Secondly, we have the Functionalist Theory which shifts away from the identity of the mind and the brain and applies the theory that the mind has functions and it is these functions which matter, rather than the particular means by which those functions are carried out. The Functionalist theory of the mind is said to be, 'what makes something a thought, desire, pain (or any other type of mental state) depends not on its internal constitution, but solely on its function,' and it is these functions that control an individual's key features.<sup>82</sup> This theory similarly situates itself in support of the higher-orientated definitions of brain death as it suggests that only the parts of the brain which stimulate the mind are important when determining an individual's mortal state, where an occurrence of total brain death is not necessarily required. These two theories of identity would prove more appealing as they reflect development within a modernised concept such as brain death. Their theories mirror the description of the higher brain standard which highlights the components of an individual which most would be concerned about, such as producing memories, consciousness, and personality; seemingly underlining the key elements of humanity and living a fulfilling life.<sup>83</sup> However, these theories about personhood and personal identity playing a key role in the determination of death have been critiqued by scholars such as Veatch, who suggests that it is wrong to claim that the higher-brain criteria are solely based on theories of either personal identity or personhood. He acknowledged the possibility that there are living human beings who do not satisfy the various features of personhood and who do not obtain the ability to perform 'vital' key functions which are considered 'essential' to one's existence to highlight the invalidity of prioritising these theories of identity when determining death. He concluded that if the law is only discussing the matter of an individual in a state of being alive or dead, then personhood is irrelevant.<sup>84</sup>

Contrastingly, contemporary giants in the field of brain death such as Henry Beecher, on the topic of personal identity, stated that the key functions of an individual are, 'the individual's personality, his conscious life, his uniqueness, his capacity for remembering, judging, reasoning, acting, enjoying, worrying, and so on.'<sup>85</sup> Using Veatch's argument, we cannot be certain that the origins of these functions all stem from either the cerebrum or the

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<sup>81</sup> Sarbey, B., 'Definitions of Death', p.748

<sup>82</sup> See Putnam, H., '*Psychological Predicates*', *Art, Mind, and Religion*, 37–48 (William Capitan & Daniel Merrill eds., 1967) Cited in: Sarbey, B., 'Definitions of Death', p.749

<sup>83</sup> Sarbey, B., 'Definitions of Death', p.750

<sup>84</sup> Veatch, R. M., 'The Impending Collapse', p.20

<sup>85</sup> Veatch, R. M., 'The Impending Collapse', p.19

cerebral cortex; however, if we apply similar ideas to those of Beecher's, in the context of heart transplants, the use of a higher-brain criterion for death would result in a proliferation of organs available for donation because of the less confining standards which would now legally define death.<sup>86</sup> Concerning the theories of identity, their key emphasis is that the mind is what gives bodily functions regulated by the brain a purpose, meaning that spontaneous outbreaks of physical movements in a brain-dead person are irrelevant. This idea could reflect a developing attitude regarding higher brain death because while contemporary medical equipment cannot entirely support these standards it does help to debunk any ideas of 'hope' in an individual who is irrecoverable, leaving little room for controversy to linger.

As medical capacity grows then the number of theories that argue something 'new' or 'innovative' increases. This is where we can see a popular rise in the higher brain standards, where supporters of this notion debate internally what definition best suits this discipline. Some claim that the essence of an individual is the integration of both the body and the mind, making these two factors the determiners of life and death. In contrast, other advocates of this definition believe in a stricter version, holding the belief that only the mind is important.<sup>87</sup>

Countries across the globe have introduced amended legislation on brain death that reflects their cultural and legal traditions. These differing notions all try to balance the grounds between applying continuously developing medical understandings, the consideration of a patient's loved ones, and the patient themselves. As defining death is a grey area, Veatch has implied that 'when there is a doubt about which of the definitions to adopt, we should take the safer policy course, especially in matters that are literally life and death.'<sup>88</sup> The safer option is one that we can see being implemented by state officials ever since the emergence of human-to-human heart transplants. Also, while the concept of brain death was initially considered unorthodox in theory and practicality, this soon changed when the efficiency and rate of survival through heart transplants were improved, and rejection was no longer an issue. The heart transplant became regarded as a suitable and ethical procedure, one which could effectively fight any type of heart disease. This means that a change in national legislation for the definition of death required adjusting to match the ongoing enhancement in medical proficiency. In the early 1980s, the US government, based on research conducted by the President's Commission passed the 'Uniform Determination of Death Act' (UDDA)

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<sup>86</sup> Sarbey, B., 'Definitions of Death', p.752

<sup>87</sup> Veatch, R. M., 'The Impending Collapse', p.21-22

<sup>88</sup> Veatch R. M. *Transplantation ethics*. Washington, DC: Georgetown University Press, 2000 69–72. Cited in: Bagheri, A., 'individual choice'.

which portrayed that an individual was dead if they fulfilled one of the two criteria that were listed. The features described that a patient was dead if they had sustained either irreversible cessation of circulatory and/or respiratory functions, or irreversible cessation of all functions of the entire brain including the brain stem.<sup>89</sup>

However, specific legislation does not apply strictly to all States of the USA. For example, New Jersey has a Declaration of Death Act (1991) that states:

the death of an individual shall not be declared upon the basis of neurological criteria ... when the licensed physician authorised to declare death, has reason to believe, on the basis of information in the individual's available medical records, or information provided by a member of the individual's family or any other person knowledgeable about the individual's personal religious beliefs that such a declaration would violate the personal religious beliefs of the individual. In these cases, death shall be declared, and the time of death fixed, solely upon the basis of cardio-respiratory criteria.<sup>90</sup>

These religious and cultural exemptions reflect the ideas stated in Bagheri's article that nobody should be considered dead based on any form of the brain death standard (often total brain death) if that patient, while competent, has asked to be pronounced dead based on the conventional cardiopulmonary standard.<sup>91</sup> Therefore, the New Jersey Declaration serves as a great example of the kind of issues that are apparent when we define death because although countries have attempted to introduce legal guidelines that firmly state the difference between life and death, subjective recognition is vital to consider when displaying these legal requirements. New Jersey, in the context of the law, has now created a situation where 'there can be living people with dead brains.'<sup>92</sup> Similarly, the Japanese government passed the Japanese Organ Law of 1997 where individuals, for the pronouncement of their death, can choose the definition related to cardio-respiratory cessation or the loss of entire brain functions based purely on their own decision; an enactment that has been labelled 'pluralism on brain death definition.'<sup>93</sup> As it is suggested by Kimura that death is not an

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<sup>89</sup> 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: US Government Printing Office; 1981. Available online: <https://scholarworks.iupui.edu/bitstream/handle/1805/707/Defining%20death%20-%201981.pdf?sequence=1&isAllowed=y>. Accessed 12<sup>th</sup> December 2022. See also: Parent, B. & Turi, A., 'Death's troubled relationship with the law', p.1056. See also: Ave, A. D., Shaw, D., Bernat, J., 'Defining Death in Donation', p.119. See also: Sarbey, Ben, 'Definitions of Death', p.745-746.

<sup>90</sup> New Jersey Declaration of Death Act, N.J. Sess. Law Serv. Ch. 90, 26:6A-5 (1991). Cited in: Sarbey, B., 'Definitions of Death', p.746-747. For further mention of New Jersey Act see: Parent, B. & Turi, A., 'Death's troubled relationship with the law', p.1058.

<sup>91</sup> Bagheri, A., 'individual choice in the definition of death', p. 146-149

<sup>92</sup> Complaint, *McMath v. Rosen*. (Cal. Super Ct. Dec. 09, 2015) (No. RG15796121). Cited in: Sarbey, Ben, 'Definitions of Death', p.747

<sup>93</sup> Morioka M. Reconsidering brain death: a lesson from Japan's fifteen years experience. *Hastings Cent Rep* 20013141-46. Cited in: Bagheri, A, 'individual choice in the definition of death'.

individual event but rather a family event in Japanese culture, the law gives power to the family to confirm or reject the choice made by the patient under certain circumstances, particularly within the context of organ donation.<sup>94</sup>

This act passed in Japan suggests that any transplant-related legislation which ultimately results in the death of the donor should include the opinion of the family when decision-making. Similarly, it is these considerations which can be seen to mirror legislation passed in New Jersey, but in a national-specific manner that applies to considerations for Japanese cultures and traditions. The developments in understanding are reflected in other state legislations where other countries have used their ideologies and perceptions to formulate their governing laws. In countries such as Canada, the UK, and Switzerland, death is determined under a single-brain criterion. In Switzerland, the Swiss Federal Act of 2004 states that ‘a person is dead when all cerebral functions, including the brain stem, have irreversibly ceased.’<sup>95</sup>

These legislative procedures reflect the differing perspectives around the globe on the controversial matter of establishing death. Whilst Bagheri has suggested that everyone should permit a conscience clause in case of the event where an individual is in a state of irreversibility with ongoing brain damage, stating clearly which definition they would like to be applied, this offers a temporary solution to the current climate and understanding of death.<sup>96</sup> It must be acknowledged that with the ever-evolving medical understandings, surgical disciplines and ideological doctrines must be susceptible to change based on curative breakthroughs. Thus, whilst Barnard’s surgical masterpiece did influence the direction of global attitudes toward death, it does not mean that the brain-oriented definitions of death will serve as permanent solutions. Legislation must continue to find the middle ground between applying innovative ideas about death and acknowledging the considerations and emotions of a permanently comatose patient’s loved ones; as prioritising one over the other can lead to great social and ethical issues.

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<sup>94</sup> Idea from: Kimura R. Death, dying and advance directives in Japan: socio-cultural and legal points of view. In: Sass HM, Veatch RM, Rihito K, eds. *Advance directives and surrogate decision-making in health care*. Baltimore: Johns Hopkins University, 1998:187–208. Cited in: Bagheri, A, ‘individual choice in the definition of death’.

<sup>95</sup> Swiss Federal Act on Transplantation of Organs, Tissues and Cells. 8<sup>th</sup> October 2004 (SR 810.21) Cited in Ave, Anne Dalle; Shaw, David; Bernat, James, ‘Defining Death in Donation’, p.119

<sup>96</sup> Bagheri, A., ‘Individual choice in the definition of death’, p. 146-149



## Conclusion

Barnard's first successful heart transplant in December 1967 prompted a shift in the medical discourse, one that stressed the importance of re-defining death. In a medical context, as the conventional definitions of death no longer reflected the advances in surgical equipment and understanding, a revised definition was required that would prove compatible with medical developments. As heart transplants served as a resolution for those with heart disease, the preservation of this procedure required a re-evaluated definition of death as the extraction of a heart under conventional understandings of death would mean that the surgeons performing this procedure would essentially be ending a life to preserve another. So, to protect surgeons from legal prosecution and gain acceptance of heart transplantation as a normal ethical event, a reassessed definition of death that focused on the cessation of brain functions rather than the traditional cardiopulmonary system would ensure the longevity of this procedure and the transplant surgeons' careers. However, whilst this new idea of determining death better reflected medical advances and capabilities, this did not mean that an uncontroversial, objective answer had been reached. As the brain has become the central focus in the determination of death, different theories have surfaced about what areas of the brain are vital to human existence, making the matter of death just as complex as it was before brain death notions were accepted as legitimate disciplines.

Nevertheless, because of heart transplant surgeries, brain death has become the most widely and legally accepted definition of death. Whilst this notion has been recognised as the most suitable way of ensuring the preservation of this procedure, the concept of brain death continues to be shaped by different perspectives and interpretations. Ultimately, these neurological viewpoints served as the perfect replacement for the conventional cardiopulmonary definition; but as theories and advances in surgical equipment evolve, this innovative idea of brain death may continue to be contested by other measures of determining death. In the meantime, however, the first heart transplant procedure and the Symposium in 1968 served as pivotal moments in the seemingly never-ending objective of defining death. Together, they established the need for a revised definition to ensure that the interests of the donor, the donor's family, and the recipient were given due regard and protection; simultaneously, they also provided the necessary legal protection for transplant surgeons whose reputations depended on the procedure's success.

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