**Baumrucker, S.J., Stolic, M., Morris, G.M., Carter, G.T., Sheldon, J.E. “Brain death and organ transplantation.” *American Journal of Hospice and Palliative Medicine.* 325:24 (2007) pp. 325-330.**

Summary: This article is a case study, discussing the case of a 48-year-old alcoholic man diagnosed with a large subdural hematoma, with no brainstem reflexes and an apnea test with no respiratory effort. Although he was an organ donor, affirmed by his family, his nephew (a PA with a neurology group) wanted an EEG to confirm the diagnosis. In the meantime, the patient experienced a cardiac arrest, and because he had a DNR order signed, he was not resuscitated. At this point the only organs acceptable for donation were his corneas. This case is analyzed in four sections, each by a different author. Interestingly, each of these authors comes from a different arena, with representation each of an ethics, legal, medical, and nursing perspective. The author of the ethics section comes to the conclusion that, as there is some question of the reliability of the apnea test, and that the EEG is fairly easy to perform, it was appropriate to honor the nephew’s wish for additional testing. Therefore, the wish to respect the patient’s family and the patient with the additional testing outweighed the autonomy of the patient in his decision to be an organ donor. The legal perspective questions the point at which harvesting the organs from another becomes an act of murder. The medical perspective interestingly points out that part of the issue at hand is the fact that we do not currently have universally accepted criteria for determining brain death. Finally, the nursing perspective points out that had the patient prepared an advanced directive and if he had designated a durable power of health care attorney, it is possible that the family would not have had the same debate regarding his care at the end of his life.

Assessment: It was interesting to see what the representatives from each of the different perspectives highlighted. Some sections were better written than others. The legal perspective became unnecessarily bogged down in the question of the dead donor rule, without paying as much attention to the specific case in hand. The nursing perspective was brief, but contained some good points. The ethical and the medical perspectives seemed to contain the more pertinent discussions.

Reflection: This article was a quick read and was interesting, not only for its ability to provide a perspective from multiple different areas, but also for the fact that it did not focus on what the definition of brain death should be or whether or not the dead donor rule should be abandoned, but rather allowed the reader to gain some insight into the practical difficulties with instituting these rules. While it does not contain any world changing rationales or arguments on the subject as a whole, it is an easy read with an interesting point of view.

**Collins, M. “Reevaluating the Dead Donor Rule.” *Journal of Medicine and Philosophy*. 35 (2010) pp. 154-179.**

Summary: First, the author begins with the argument that brain death is not equitable to death, a point that he argues by detailing the points of view on both sides of the question. The main issues with brain death that are proposed are what the author describes as the unreliability of the diagnosis, as well as the dissonance between the conceptual definition and the medico-legal definition of death. He argues that many of the arguments in support of the conceptual definition have not been kept straight, but rather have been conflated with each other, confusing the issue. Essentially, his disagreement with the concept can be distilled down to his argument i) the loss of brain function does not result in the loss of integration of the individual and ii) the loss of consciousness does not equal death. Therefore, the loss of brain function itself does not equal death. The author then writes about the principles that are involved in the guidelines around organ donation, particularly as they relate to the dead donor rule. Given that he has concluded that those who are brain dead are not actually dead, he argues that organ donation from those who are diagnosed as brain dead does not uphold the principle of autonomy as informed consent cannot truly be given by an individual if they are working under the fallacy that their loved one is dead. The author proposes that the dead donor rule should be re-evaluated so that brain dead individuals can be considered for organ donation even though they are alive, arguing that there are certain situations where it is morally acceptable to be the proximate cause of death of a patient. The author them discusses the potential challenges of accepting this definition, including what public policy changes would be necessary, as well as potential implication for the transplant community.

Assessment: This article can be dense at times and somewhat difficult to follow. There is little history given about the development of the definition of brain death and the dead donor rule, but rather jumps into the controversy in the very middle of the debate. The author does provide some very intriguing arguments in support of abandoning the current definition of brain death and the dead donor rule. Additionally, he does a good job of pinning down some of the flaws in the arguments of the opposing opinion.

Reflection: Given the strength of the arguments provided in this article, I think it is very well worth the read. However, given its complexity and density, I would suggest not reading this as your first pass through the topic, but would rather save it until you have done more reading on the topic.

**Collins, M. Death, Brain death, and the limits of science: Why the whole-brain concept of death is a flawed public policy. *Journal of Law, Medicine, and Ethics*. 38 (2010) pp. 667-683.**

Summary: The article is centered around the many ways that death can be defined and the ways that each of these definitions are important to and interact with the concept of brain death, as well as that of organ donation. These different definitions include death as a biological event, a commonsense concept, a legal definition, and a personhood concept. Collins states that the only definition of death that is in the realm of science, or rather, that can be seen as a fact rather than a moral judgment, is the biological definition. By placing the definition of brain death in the biologic realm, the scientific community pushes forward the definition as fact, which the public does not have the expertise to argue against. He argues that the determination of brain death and when it is appropriate to turn off life support or donate organs should instead be a social issue, like abortion or stem cell research. Additionally, Collins argues that brain death is not equivalent to the biological definition of death. He states that when those who are giving consent for organ donation hear the word death in the phrase brain death, the greatest part of their understanding naturally includes the biological notion of death, rather than the brain death notion. Therefore, the use of the phrase brain death is disingenuous for those individuals, and they are not maintaining their autonomy as they are giving their consent because of a definition that they do not understand.

Collins supports the notion that it is morally acceptable for patients to decide to be an organ donor or for families to consent to organ donation for a brain dead individual; despite the fact that he does not believe they are dead. He also goes on to suggest that the legal definition of death should correspond more so with the biological definition. This would of course have implications to the process of organ donation, as brain dead individuals would no longer be considered dead. There would be a necessity to change laws so that causing the death of brain dead individuals via organ donation would not be considered homicide. Of course, herein lies the problem, as there is a risk that the public would reject the idea of organ donation from a brain dead, but living individual. If the laws could not be rewritten, then organ transplantation would no longer be possible from brain dead individuals, and the already short supply of organs for donation would grow even shorter and thousands could die. Collins points out that there are some who would argue that it is worth maintaining this disingenuous definition of brain death in order to protect those thousands who would not be able to receive an organ donation. He goes on to argue that the foundation of medicine is trust, and that maintaining this definition is violating this.

Assessment: Collins makes strong arguments in support of abandoning the dead donor rule. He makes unique arguments that I found provocative and important to the subject as a whole. I found his distinction of brain death as a moral judgment rather than a biologic fact to be an important one, as well as pointing out the ad hoc definitions of brain death as provided by Bernat.

Reflection: Written by the same author as Re-evaluating the dead donor rule. Similarly, it has some of the same drawbacks, which includes the fact that it can be quite dense and wordy, making it difficult to follow at times. However, it is worth the effort as the author continues to make unique and important points. Again, I would not recommend this reading for a first pass through the subject.

**Iltis, A.S., Cherry, M.K. “Death revisited: Rethinking death and the dead donor rule. *Journal of Medicine and Philosophy*. 35 (2010) pp. 223-241.**

Summary: Iltis and Cherry begin by providing a discussion of the history of the development of the definition of brain death, including the Harvard Ad Hoc Committee, the UDDA, and the President’s Commission’s report. Next, they go on to discuss the four areas of debate for brain death and the dead donor rule. These include whether the criteria for determining neurologic death are appropriate, whether the diagnostic modalities currently in use are appropriate for diagnosing brain death, whether or not the dead donor rule could be abandoned, and finally what implications donation after cardiac death has on the criteria for death. This includes a description of the donation after cardiac death process. Finally, the authors circle back to the topic of the dead donor rule, providing commentary from the experts in the area to demonstrate the great controversies that are still present over the topic.

Assessment: Article provides a good history of the subject of brain death, allowing for the placement of these arguments in their appropriate context. Additionally, the authors touch on the arguments produced by many of the experts in the field. They themselves do not produce a final judgment on the appropriate resolution of these controversies, but rather acknowledge the great ongoing debate to make the point that the subject has not been put to rest.

Summary: Great place to start on the topic of brain death. The authors do not get into many of the nuanced details that are addressed in other articles. However, it does provide a good history of brain death, assisting the new reader with putting the debate into its context. Additionally, it provides a good survey of many of the issues that are up for debate.

Joffe, A.R., Anton, N.R. “Some questions about brain death: A case report.” Pediatric Neurology. 37:4 (2007) pp. 289-291.

Summary: This case report describes a young female who had an anaphylactic reaction to peanuts with 45 minutes of CPR. She was initially cooled and then rewarmed over the next day. At that time, she had a GCS of 3, fixed and absent brainstem reflexes (cough, gag, corneal, oculocephalic, vestibulo-ocular). She also had an apnea test with no respiratory effort and an increase in PaCO2 from 33.7 to 72 mmHg, as well as a radionuclide cerebral blood-flow study indicating no brain blood flow. Despite this, her diagnosis of brain death was initially delayed due to the fact that a bilateral lower-limb withdrawal response was observed on several occasions to several different stimuli. The article then focused on the question of what examination signs are necessary for a diagnosis of brain death and which ones are sufficient to preclude that diagnosis. Additionally, the authors discuss this withdrawal reflex and whether it is possible that the withdrawal is solely a spinal reflex rather than a brainstem reflex.

Assessment: The authors touch on a very important topic within the diagnosis of brain death itself (working within the current accepted definition of brain death). That is, the longstanding rationale for equating brain death with death is the idea that brain death marks the irreversible loss of the critical functions of the brain providing for the integrative unity of the organism as a whole. However, defining exactly which functions count as critical to the functioning of the brain has been difficult to pin down. This article provides a thorough discussion of that question in a real-life setting. Additionally, it covers the topic of which spinal reflexes may continue to be present in brain death and whether we can even determine whether these reflexes are actually spinal and are not coming from the brainstem. This is another important topic to consider as these reflexes may or may not cloud the picture when forming a diagnosis.

Reflection: This article is a quick read, but contains many high-yield topics of discussion (pointed out above). While it will not give the reader a sense of the controversy surrounding whether or not brain death truly should be considered equivalent with death, it does focus on important points surrounding the process of coming to this diagnosis.

**Kompanje, E.J.O., McCullough, L.B., Applbaum, A.I. “Request for complementary medicine after brain death. Letter.” JAMA 300:13 (2008) pp. 1517-1518.**

Summary: This article is the response of two authors to a case report written up in the journal. It also includes the original author's reply to these criticisms. The case is that of a 19-year-old patient who was declared brain dead and in whom the removal of life support was delayed for 2-3 days after her family requested time to administer complementary medicine. The first responding author argued that this was inadvisable for several reasons. Firstly, delaying the removal of life support gives credence to the notion that brain death is not equivalent to death. Additionally, the author evokes concern over distributive justice as the patient, diagnosed as dead by the team, was taking up a bed in the ICU that may have benefitted another. Finally, this author felt that in the case that the family decided to donate the patient's organs, the therapy would have unnecessarily added a risk to the organ recipient. Among the criticisms held by the second responding author included the belief that the original author should not refer to the individual as a patient and should not have referred to the medical interventions as life support, but rather should use words like cadaver and corpse. He also rejected the decision to allow the administration of complementary medicine because it promotes a false hope for the rest of the family. Additionally, he felt that the decision was unfair as other providers were then required to take care of the clinical duties, which may have caused them emotional distress for those who may have felt that it was clinically inappropriate. The original author's response addresses some of these concerns. He makes the interesting point that the use of the word patient is a description referring to the individual and not to their status, "so disconnecting a dead patient from life support is no more contradictory than unzipping a dead sailor from a life vest." Finally, the author feels that allowing the treatment did not mislead the family, but rather allowed for respect for autonomy.

Assessment: This article was impacted negatively by the fact that most of the issues discussed in it applied more to the specific case and cannot be generlized to the ethical discussion of the field as a whole.

Reflection: This is a short, easy to read article, but I do not think it is really worthwhile for someone doing a review of the literature. Perhaps the original article would prove more informative.

**Liao, S., Ito, S. “Brain death: Ethical challenges to palliative care concepts of family care.” *Journal of Pain and Symptom Management*.40:2 (2010) pp. 309-313.**

Summary: A case report, which discusses a scenario where a brain dead patient was continued on the ventilator as his son, who would not make any decisions over the phone, lived in a foreign country and was unable to get a visa for a few weeks. During this time, the patient’s daughter, who had originally accepted the diagnosis of brain death, but was deferring to her older brother for decisions, began to reject the diagnosis of brain death and to see her father as alive. This was all in the context of the knowledge that the patient had previously stated that he would not wish to be continued on artificial life support, but did not have an advanced directive. The article provides insight into some possible ramifications of delaying diagnosis, which are contrary to what one may intuit. These ramifications touched upon included a decreased acceptance of the diagnosis by family as time went on, choices that were not in line with the patient’s requests and which impaired autonomy, lost chances for organ donation, the risk of tying up an ICU bed, increases in the overall costs of health care, as well as increased risk that insurance would not pay the hospital bill, leaving the family with a costly bill to cover. The author makes the point that it is important for all health care professionals to have a good understanding of the definition of brain death so that their actions are not incongruous with what the physicians are telling the patient’s family. The article also touches on how the risk of insurance fraud can place time constraints on discussions with family members and decision making, as well as how confirmatory testing is pursued.

Assessment: This article is not focused on the appropriateness of the current definition of brain death, but rather focuses on ethical considerations in proceeding with care under the current guidelines. It provides some insight into some of the issues a health care provider may face when they have a patient who is or will likely be pronounced brain dead.

Reflection: A brief read that I would recommend because, as I mentioned above, it is unique in its focus on the implementation of the current guidelines, rather than the guidelines themselves.

**Shemie, S.D. “Clarifying the paradigm for the ethics of donation and transplantation.” Philosophy, Ethics, and Humanity in Medicine. 2:18 (2007) pp 1-5.**

Summary: This article focuses on the dead donor rule and the practice of donation after cardiac death. The authors point out that in many discussions, the debaters make a mistake by treating death as if it is a process that had a clear distinction between life and death. The author points out that in the past, prior to the development of organ transplantation, the diagnosis of death was a muddled and not particularly rigorous process, but that it was not as necessary for it to be. Rather, the technological advances that have allowed for organ transplantation have increased the necessity for a clear distinction to be made. However, the process of death is a gradual event for the body and different cells and organs break down at different paces. Shemie also makes it a point to refute those who argue against donation after cardiac death over the possibility of auto-resuscitation occurring after two minutes, commonly the time waited after life support is removed. He argues that auto-resuscitation after two minutes has never occurred in a controlled environment where CPR had not been administered, which is the setting in which donation after cardiac death takes place. Therefore, there is essentially no risk of auto-resuscitaiton occurring in this environment.

Assessment: This article by no means provides an exhaustive account of the issues surrounding the dead donor rule and donation after cardiac death, however it does cover a few issues in that arena, most importantly which is making the argument that auto-resuscitation after two minutes is not seen in the controlled environment in which donation after cardiac death would take place, therefore that is not an adequate argument against the practice. On the more conceptual front, the author also makes the important point that death occurs on a continuum and that while our changing technology has made it more imperative to precisely determine time of death, we would do well to remember that it is not a finite point in time, but rather occurs gradually with cells and organs dying at a different rate.

Reflection: As the article does not focus on brain death for much of the paper, it is not the best article for someone looking for a cursory review of the issue, however, a better understanding of all the issues around organ donation and brain death can aid in a more nuanced knowledge of the specific issue of brain death.

**Shewmon, D.A. “Brain Death: Can it be resuscitated?” The Hastings Center Report. 39:2 (2009) pp. 18-24.**

Summary: The author provides a very succinct description of the early history of the concept of brain death. The majority of the paper deals with the more recently written white paper of the President’s Council on Bioethics. The author summarizes the President’s committee’s take on the previous philosophical reasoning behind the concept of brain death and why the committee rejects those philosophies. The author discusses the position given by the committee for its continued support of brain death, as well as providing a thorough rebuttal to this argument.

Assessment: While acknowledging the courageousness of the President’s Council for formulating a new rationale for brain death, Shewmon very thoroughly refutes the reasoning of the Council. However, his rebuttals are often somewhat pedantic and difficult to follow.

Reflection: The main value of this article is in that it provides the reader with a fairly succinct summary of the updated President’s Council on Bioethics, Controversies in the Determination of Death, as well as some of the issues with the arguments proposed in it. However, I would not say that it is of great value for someone looking to do an abbreviated level of research into the area of controversy as a whole.

**Truog, R.D., “Brain death: too flawed to endure, too ingrained to abandon.” *Journal of Law, Medicine, and Ethics*. 35 (2007) pp. 273-281.**

Summary: In this article, the author addresses why brain death, although widely accepted and implemented, is still highly controversial. A major reason for this controversy that is provided by the author is the cognitive dissonance experienced by others when seeing a patient who is brain dead. The author further demonstrates the cause of this cognitive dissonance by detailing, in a very straightforward table, the differences in appearance and abilities between individuals who are alive, dead by cardiorespiratory criteria, and dead by neurological criteria. He then goes on to explain the costs and benefits from implementing neurologic criteria for death. The benefits lay primarily in the ability to answer the following questions: when should life support be withdrawn for the benefit of the patient, for the benefit of society, and when is it permissible to remove organs from a patient for transplantation. Meanwhile, the costs are described as “pay[ing] the price of self-delusion,” as well as causing clinicians to become enclosed by a rigid definition. Finally, he discusses strategies for resolution, where the options are described as “move the goalposts, or change the game.” These options are listed as retaining the dead donor rule, but reworking the definition of death so that more patients are considered dead (move the goalposts) or discarding the dead donor rule (changing the game), which is the strategy that the author supports. In the end, the author comes to the conclusion that, as the title suggests, the concept of brain death is “too flawed to endure, but too ingrained to abandon.” The author suggests that there are unlikely to be any changes to this policy in the near future, but rather that changing technology in the field of organ transplantation will decrease the need for organ donors.

Assessment: The author provides a good summary of the current controversies surrounding the concept of brain death, supported by several examples of how the concept of brain death has been misconstrued in the popular media (including one case involving Dr. Sanjay Gupta). The table provided is really helpful in illustrating the concept that the author later refers to as “self-delusion” by health providers – namely, that brain dead patients do not seem dead. I found the biggest flaw in the article is that the author dismisses the need to address the first two questions that the concept of brain death helps to answer (when should life support be withdrawn for the benefit of the patient and for the benefit of society), based on the fact that other approaches for determining futility of care have been determined, which he then provides citations for as an explanation, but which I did not find particularly illuminating. With those questions now dismissed, the author then focuses on the question of transplantation for the remainder of the article. I felt that his dismissal was not adequately explained, particularly since in the final section, he argues that with advancing technology, the need for human organs will be replaced by other options, thereby, according to the author, making the definition of brain death obsolete. However, I felt that the need for a concept such as brain death to help answer those first two questions will not be addressed in that scenario and should not have been explained away so flippantly.

Reflection: This article is a great place to start when reading about brain death. The article is set up in a way that is very easy to follow - why brain death is controversial, why we have it in the first place, and what could and should be done about it in the future. The author also explains different definitions that have been proposed for brain death, such as the “whole brain” and the “higher brain” criteria, as well as explaining the drawbacks to using these definitions. Overall, I felt that this article was very easy to read with a lot of valuable content.

**Truog, R.D., Miller, F.G. “The Incoherence of Determining Death by Neurological Criteria: A Commentary on Controversies in the Determination of Death, A white paper by the President’s Council on Bioethics.” *Kennedy Institute of Ethics Journal* 19:2 (2009) pp. 185-193.**

Summary: Miller and Truog begin, as many other articles do, with a short review of the history of the development of the definition of brain death, as well as the controversies surrounding it. This article, similar to the article “Brain Death, Can it be Resuscitated,” is a review of the white paper released by the President’s Council on Bioethics titled Controversies in the Determination of Death. The authors begin by noting the improvements and changes between this article by the President’s Council (2008) and that of the President’s Commission, Defining Death (1981). One of the improvements noted upon is a change in terminology, whereby total brain failure was proposed to take the place of brain death. Importantly, Miller and Truog point out how the President’s Council abandons the concept of the loss of the “integration of the organism as a whole” as being the key rationale behind the concept of brain death. Rather, the Council develops a rationale that has not yet been proposed, that death occurs when an individual is no longer able to perform the “vital work” of a living organism. The authors then go on to criticize the description of what is vital work and how those who are brain dead fail to perform that work. Additionally, they go on to refute the idea of a “higher brain” criteria for determining brain death, largely because this would also then include those patients who are in a persistent vegetative state and are spontaneously breathing in the definition of dead. They go on to report that there are two policy options that are possible if it becomes agreed upon that total brain failure is not equivalent to death: Continuing the dead donor rule and curtailing organ donations from these patients or abandoning the dead donor rule. The authors support the idea of abandoning the dead donor rule by offering up the withdrawal of life sustaining treatment as an example of a time when physicians are the proximal cause of a patient’s death and it is considered morally justified. Finally, the authors end by proposing that in the future, a public bioethics commission should address the question of whether abandoning the dead donor rule would be morally justified.

Assessment: This paper provides a much more coherent summary and response to the President’s Council (in comparison to the Brain death, Can it be Resuscitated article). It is easy to follow and logical. It also provides a good summary of the main points of the white paper, without requiring that you read the extensive volume.

Reflection: I would recommend this article for a second round of reading. I think it provides useful information as far as the current state of the field, however it is more specific information that would be more useful to someone who was looking for greater depth in the subject.

**Reflection on the project**

I am really happy that I was able to do this elective during medical school. The concept of brain death is a confusing one. In the ICU, I can see how it may become easy to reconcile the idea of brain death as being equivalent to death as you are aware of the eventual conclusion for the patient. This research allowed me to think about the intricacies involved in this area when I am closer to a layperson and can more easily relate to the families to whom I may be trying to explain this concept in the future. Additionally, I was able to think about the nuances involved in the discussion, rather than just taking the definition of death by neurological criteria at face value. This will allow me to have a more informed response to both patients and other providers when there is a rejection either of the definition or of the diagnosis. Finally, it is important to understand the past developments in your field as it aids in informing the future. I feel very comfortable now both with the current status of this debate within the field of neurology and bioethics.