**Faith & Reason Honors Program**



**SENIOR THESIS**



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**Abstract**

Neurosurgeon Sergio Canavero of Turin is proposing the world’s first human head transplant in less than two years. Human head transplantation seeks to circumvent the disastrous effects of a progressive illness that will ultimately result in death by transplanting a living person’s head onto a dead person’s body. Supposing that this procedure is/will be medically possible, the question remains whether the procedure should be done. The question of whether the procedure should be done falls into the domain of biomedical ethics. Bioethics needs to be grounded in an understanding of human dignity and so the Catholic perspective of the human person was adopted for this paper. The Catholic persective views a human person as an embodied spiritual soul whose dignity comes from being created *imago Dei*. It was found that the bioethical evaluation based on the Catholic understanding of human personhood and dignity on human head transplantation has to necessarily conclude that the procedure violates the dignity of the human person and therefore cannot be ethically permissible.

1. **Introduction**

There is a flash of lightning that seems to tear the sky into two. The patient begins to awake. All around are anxious to see if it has worked. The patient rubs his eyes with his hands, and the proclamation echoes forth that “it worked; the head transplant was a success!” The excerpt above seems like an adaptation from the classic Frankenstein novel, but a surgeon from Turin seeks to make this a reality in the near future.

I first came across the sensational headline, “Italian doctor to do first head transplant in China” (“Italian Doctor”) during my study abroad in Rome. I was surveying the English version of the local news website. The article discussed how neurosurgeon Sergio Canavero is seeking to perform the world’s first human head transplant. Immediately my curiosity was peaked, and as I scoured through various news articles I came to realize that the procedure was a serious proposal. The concept is that a person who has a progressive disease that will ultimately result in death such as Valery Spiridonov, the first volunteer for the procedure, could surgically have his head put onto the body of a deceased donor patient circumventing the illness’s disastrous effects. The procedure peaked my medical curiosity, but it also exposed me to a deep and probing question. Even if it’s medically possible to perform a human head transplant would the procedure be ethically permissible?

Supposing a human head transplant is now within the realm of possibility; the question remains as to whether the procedure should be done. In order to answer this question it is necessary to turn to ethics and ultimately what it means to be a human person with dignity. A bioethical evaluation based on the Catholic understanding of human personhood and dignity on human head transplantation will necessarily conclude that the procedure violates the dignity of the human person and therefore cannot be ethically permissible.

1. **The Prospect of Head Transplantation**

Medicine has been growing in leaps and bounds from the time that Andrea Vesalius in the 16th century published his work “*De Humanis Fabrica”* (Lantieri 25) laying down the foundations for anatomy as a discipline. In the mid-twentieth century alone, internal organ transplantation has become a reality starting with the kidney in 1954, the liver in 1963, and the heart in 1967 (Lantieri 25). Following the advent of internal organ transplants the first face transplant took place in 1985 (Christensen, par. 12), and the first successful hand transplant was done in 1998 (Lantieri 25). There can be no doubt that medicine is now able to perform feats that even a hundred years ago would seem to be in the realm of mere fantasy. The procedure of transplanting a human head or, as some would prefer to categorize it a human body, medically speaking has had one remaining hurdle to overcome. The hurdle is connecting nerves in the spinal cord. However, recently the proposed procedure by Canavero incorperates a method that he calls GEMINI that will supposedly will enable spinal cord reattachment thereby advancing human head transplant from a simply theoretical construct to a procedure that could be implemented.

The medical terminology for a human head transplant is technically a cephalosomatic anastomosis (Lamont, par. 3). The word cephalosomatic anastomosis has three distinct parts ‘Cephla-' refers to the head, ‘somatic’ the body, and ‘anastomosis’ the attaching of the two together. There is great debate as to whether the head or the body is actually being transplanted in the procedure. Those in favor of the term body transplant argue on the grounds that organs from a brain-dead donor are transplanted to a live person, and conversely a live organ is never transplanted to a dead person. Those in favor of the term head transplant argue on the grounds of mass since a person’s head accounts for approximately twenty percent of a person’s mass and therefore the head would be transplanted onto a more massive body. The use of the term head transplant is a more sensational phrase, however since it is more prevalent throughout the literature this paper will typically refer to the procedure as such. As it will become evident, the discussion as to whether the head is being transplanted onto the body or the body is being transplanted onto the head is not simply semantics. There are resounding ethical implications based on the understanding as to which procedure is actually occurring.

The procedure is being proposed as a last resort for patients with debilitating diseases currently without a cure such as ALS, other types of muscular atrophy, and certain types of cancers. In these diseases the body typically is affected but the head, at least before the diseases fully progress, remains unscathed. The possibility of transplanting the brain apart from the body remains well out of the range of medical possibility at the present time, however transplanting the head seems to be more manageable. There are many potential other applications that one could foresee arising if this procedure were to be successful such as being a form of gender reassignment surgery. However, this paper focuses on human head transplantation only in the context of a person who has an incurable disease which will result in death. The choice of this focus aligns with the surgeon’s primary intention for the surgery and the argument of most weight for the proposed necessity of the surgery.

HEAVEN which stands for the “Head Anastomosis Venture Project” (Canavero) is the title of Sergio Canavero’s proposal of the surgical procedure to transplant a human head. Canavero suggests that the surgery could take place as early as Christmas 2017 in Harbin, China (Lamont, par. 3-8). Dr. Canavero indicated that he chose China as the location for his surgery because of his belief that China, unlike most western countries, would not delay the procedure from the proposed timeline extensively for ethical approvals. His efforts would be supported by both the Harbin Institute of Technology and Harbin Medical University (Lamont, par. 3).

The procedure would take place in a double theatre operating room with a large surgical team consisting of nearly a hundred medical professionals that include specialists from a wide swath of medical disciplines. The actual procedure as laid out is to be comprised of hundreds of intricate steps. The procedure is truly a marathon surgery; a procedure which will make heart transplantation seem like a mere 5K in comparison. The work of Canavero is based heavily on the work of Dr. Robert White who performed the first monkey head transplant without spinal cord reattachment in the 1970s (Berko). The monkey survived for approximately a week after the surgery. Dr. Canavero’s work also relies on research concerning spinal cord reattachment. Only the major framework of the procedure will be laid out here so as to provide a sufficient overview of what the procedure will entail without expounding on the specifics ad nauseam.

Following all the necessary preparations and the anesthetization of the patient, the first step would be to remove the heads of both donor and recipient by making “deep incisions around each patient’s neck carefully separating all the anatomical structures at the C5/6 level forward below the cricoid” (Canavero, par. 41). The C5/6 level refers to the cervical vertebrae of the neck.

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The figure shown above is from the work of Dr. Robert White on monkeys and was also used by Canavero in his paper laying out the HEAVEN procedure (Canavero). Both proposals have the major incission occuring at the same level. It is important to note that the position of the main cut is below the level of the brainstem such that the entire brain of the body recipient remains in his head.

The head is able to be detached and reattached without neurological damage theoretically due to lowering the temperature of the head so that the patient’s brain is in a hypothermic state. The decrease in temperature from 37°C to 18°C minimizes the oxygen demands of the brain. The body as determined by other transplant surgeries can be at this reduced temperature for “45 minutes […with] virtually no discernible neurological damage” (Canavero, par. 4). Three more cuts are necessary at this point, “two along the anterior margin of the sternocleidomastoids plus one standard midline cervical incision” (Canavero, par. 41). After the completion of these steps the heads are completely detached.

The head of the ‘living person’ would then be drained of the blood in it before linkage, and flushed with iced (4°C) Ringer’s lactate (Canavero, par. 5). Blood supply to the head would then be quickly reestablished.

Based on the neurological criterion which will be discussed later only the person who is receiving the body is considered to be living. The brain is put into a lessened metabolic state and flushed with solution, but at no time is their complete cessation of brain wave activity or prolonged enough circulation cessation to merit declaration of death.

At this point spinal cord reattachment would take place. Canavero backs his assertion that his proposed method of reattachment, GEMINI, will work on several key factors. First, Canavero cites “two contemporary cases [that] prove that a transected spinal cord can be bridged with functional restoration” (Čartolovni, par. 8). Canavero says that as evidenced by the cases having “ ‘a clean cut’ [is] the key to spinal cord fusion” (Čartolovni, par. 18). The force of such a cut could approach a mere 10 Newtons of force as compared to the 26,00 Newtons that causes typical spinal cord injuries such as in an automobile accident (*Head Transplant Surgery*). The GEMINI method seeks to utilize the often overlooked “motor-sensory highway in gray matter” as opposed to the “pyramidal tract” (Čartolovni, par. 9). The reattachment of the nerves would be stimulated by the use of the fusigen sealant polyethylene glycol and its derivatives (*Head Transplant Surgery*). In addition, small electrical shocks at the point of fusion would be administered (Lamont, par.14). These two elements used in tandem, would according to Canavero, allow the gray matter tracts of the head and body to attach to one another; a procedure done in rodents indicates that this method may indeed be successful. Alignment of the nerves is key for this aspect of the procedure to be a success, however Canavero stipulates that only approximately ten to twenty percent of nerves would need to connect in order to regain “some movement” (Lamont, par. 14). At this point the largest theoretical obstacle will have been overcome.

The steps of GEMINI as discussed may appear to be like a foreign language to an audience without a medical background. In layman’s terms the main theory underlying GEMINI is that a clean cut of the spinal cord with the help of various compounds could allow for successful reattachment. The signals may take a different path than before, but the brain of the body recipient would be able to control the attached body. It is necessary to note that the proposed method of GEMINI is based on a serious consideration of human neurology, and is not merely a purly speculative procedure to be written off. As a result, there is an increased urgency to discuss the ethics of the procedure of head transplantation.

After the spinal cord reattachment other specialists would step in. The “reattachment of head-body arteries, muscles, windpipes, [and the] gastrointestinal tract have become routine surgeries” (Lamont, par. 53). It would be revolutionary to perform all the surgeries back-to-back it is nonetheless entirely feasible. Once the patient finally awakes there would be intense psychological rehabilitation in addition to the necessary physical rehabilitation. The psychological rehabilitation would promote psychological acceptance of the new body most likely through utilizing virtual simulation and hypnosis (Lamont, par. 15).

It is worth reiterating that the procedure as highlighted is a vast oversimplification of the proposed procedure, and that even if this particular procedure proves to be unsuccessful a human head transplant based on the current trajectory of modern medicine very likely will become possible one day.

There is a temptation to try and either simply doubt, or maybe even hope that head transplantation will be unsuccessful or just to take a wait and see approach. In some cases, waiting to see what happens and then taking action is not only an option, but is actually proper for a particular situation. However, when it comes to discussing the ethics of a proposed procedure the time to act is before the procedure is enacted, because once the proverbial barn doors are opened it becomes next to impossible to get the horses back in the barn. It is very rare to see a procedure successful in its goal stopped by ethicists especially if the discussion is only started after the procedure comes out. The fruits of such a discussion may only reach a conclusion long after it becomes common practice and engrained into the practice of medicine.

It is time to engage into a serious discussion regarding the ethics of human head transplantation. The idea of this procedure is by no means new. Dr. Robert White, who as mentioned earlier did the first monkey head transplant, did so with an eye towards performing a human head transplant. Dr. White had lost a friend due to cancer, and so sought to find a way to prevent premature death in others with such diseases (*Head Transplant Surgery*). Dr. White recognized that removing the brain would be nearly impossible based on the level of scientific knowledge regarding reconnecting nerves at the time, but that it would be more feasible to remove the brain as encapsulated by the head. It would be easy to simply write off Dr. White as a mad scientist, but he was actually a member of the Pontifical Academy of the Sciences (Berko), and stressed not only the need for medical advances but “the moral and social justification of such undertakings” (Canavero, par. 1). Dr. White recognized that the question of whether we ‘can’ do a procedure is a lot different and needs to be subservient to the understanding of whether we ‘should’ do a procedure.

Dr. White seemed to have favored an in-depth investigation into underlying moral/ ethical issues regarding head transplantation. Dr. Canavero, on-the-other hand based on his decision to move the procedure to China to curtail waiting for ethical approval seems to show a disregard for such investigation. There has been a pushback from the humanitarian disciplines as a whole against the attempt to be neglected as inferior to the sciences and rightly so. However, medicine which used to recognize itself as more than simply science has become increasingly scientific, and so ethics is increasingly divided from practitioners so that the doctors begin to push almost all ethical considerations to others. In theory, this enables doctors to worry about practicing medicine and lets ethicists hash out what the proper course of action would be in a given situation, but an all too real side-effect is that ethicists become viewed as simply whistle-blowing hindrances to technological progress. Doctors should not all become ethicists, but it is necessary for doctors to see themselves as more than simply scientists. Doctors must at the very least be willing to recognize the necessity for open ethical discussion before a new procedure is to take place as Dr. White did.

Science cannot judge by itself the inherent morality of a medical procedure. The effectiveness of an alternate conception method can be determined through the scientific process, but not the morality of such a procedure (Furton 11). Kidnapping as Edward Furton writes could also be proven, by the same methods, as an effective means of securing a child. However as most would contend, kidnapping is a moral wrong (Furton 11). Science by its very nature is concerned with the question of ‘how’ things work, and through that understanding can begin to understand how things ‘can’ be manipulated. Science cannot determine whether something ‘ought’ to be done; it is simply not in the toolbox of the trade. It is more than evident that science alone is not enough to determine whether human head transplantation ‘should’ occur, and so how can such a determination be made?

In order to address the ethics behind human head transplantation in a well-balanced fashion first, differing approaches to bioethics will be assessed in regards to the properties of each and how the understandings of the approaches would be applicable to the procedure. After this introduction to biomedical ethics it will become evident that to sufficiently address the issue, one must delve into what it means to be a person and have dignity. A lifetime could be spent in trying to delve into human dignity and what it means to be a person and so a specific view will need to be adopted, for this paper that view will be the Catholic perspective. The remainder of the paper will then to seek to determine the implications of this view on transplantation as a whole, and specifically human head transplantation.

1. **Biomedical Ethics**

Ethics according to Beauchamp and Childress “is a generic term for various ways of understanding and examining the moral life” (Beauchamp 1). The key to the definition is the idea of various ways, because while it is desirable to have one concrete model of how to approach a situation, it is not the reality of ethics. The scientist may desire to cast ethics aside upon this finding, but in reality every discipline has differing approaches to studying the same thing. Consider how a physicist, a chemist, and a biologist all of whom are members of the scientific discipline may analyze the same object but focus on vastly different aspects of the object.

One method of approaching biomedical ethics is principlism. Principlism is a top down approach to ethics in which certain ‘indisputable’ principles at the core of medicine are determined and applied to various situations. It is essentially a variety of deontologism. The word deontologism is derived from the Greek word for duty, “*deon*” (Shannon 22), which concerns obligations. It is the obligation of every physician to fulfill these principles to the highest degree possible. However, in particular situations one principle may necessarily be lacking in order to bolster another principle. Each principle and its respective weight in a given situation are compared to determine the ideal course of action according to the theory. A useful concept in understanding the principlism theory is a “*prima facie*” (Beauchamp 14) obligation which is an obligation that must be done in so far as there is no equal or more substantive obligation in an instance. Tom Beauchamp and James Childress who write extensively on biomedical ethics from the principlism perspective identify four clusters of moral principles. These principles are respect for autonomy, nonmaleficence, beneficence, and justice (Beauchamp 12).

Respect for autonomy is based on a patient being given the complete truth by a physician concerning a medical procedure or treatment, the patient being able to make a well-formed judgement based on that information, and that judgement being respected by the physician. Living wills are a prime example of respect for autonomy in which “each of us autonomously decides when [essentially] our life would be so lacking in personal dignity as to be no longer worth preserving” (Meilaender 51-52). A medical team is bound by the directives of a living will unless through a court appeal or decision by a family member, who acts as a power of attorney, the directives of the living will are overturned. Respect for autonomy is rooted in a desire to prevent medicine from becoming paternalistic. However, a distortion of respect for autonomy can result in a consumeristic approach to medicine in which patients dictate to doctors what treatments or medicines they want regardless of medical necessity. An accusation against Beauchamp and Childress is that when assessing situations they tend to give respect for autonomy preference over the other principles (Fisher 193).

A human head transplant like most transplants is a fully elective procedure. Patients are made fully aware of all the possible consequences before entering into surgery. Therefore such a procedure would not violate patient autonomy. Dr. Canavero explicitly puts precedence on patient autonomy compared to all other principles. Dr. Canavero states “‘the only person who can decide to undergo this surgery is the man who will benefit. Not you. Not society. The patient decides’” (Lamont, par. 60).

Nonmaleficence is perhaps the most well-known moral cluster in medicine with its axiom being “*primum non nocere*: ‘above all do no harm’” (Beauchamp 113). The principle focuses not only on not imposing intentional harm, but also “includes obligations of not imposing *risks* of harm” (Beauchamp 117). Almost every medical treatment or procedure contains risks of harm, and so this is where the weighing of principles becomes essential. Nonmaleficence is often juxtaposed with the next principle which has to do with doing good. The question becomes do the potential costs of a procedure outweigh the potential gains?

Head transplants have many potential negative outcomes from organ rejection in which the body may try to reject the head, psychological trauma, debilitating pain, paralysis, prolonged coma, neurological deficits, and death. Proponents for human head transplants oftentimes argue from the perspective that death is the worst possible harm, and therefore since there is the potential to live longer, if the surgery is successful, than all the potential consequences for someone who has a disease which is certain to end in death are insignificant in comparison.

The absence of evil is not good and similarly the absence of harm is not benefit. Beneficence is the cluster of principles that ascertains that in medicine one should always strive for the patient’s benefit not just to avoid doing harm. Beneficence as aforementioned is often juxtaposed to nonmaleficence and rightly so. Surgery by its very nature is a trauma which puts much stress on the body and always carries risks, however the benefits of a surgery may be such that the risks are acceptable whether in nature or in degree. Nature refers to side effects such as mild pain or queasiness. Degree the likelihood of a side effect such as a risk of death that is infinitesimally small. The nature of the risks and the degree of occurrence may be higher in an instance, but the benefit may still outweigh these factors such as a risky surgery for a patient who was in a major accident.

The ultimate benefit of a head transplant surgery would be to live a longer life, but the question is not only what are the risks and side-effects medically, but also what would it do to the dignity of the human person and if it is found to be at the detriment of human dignity can it be justified.

The fourth moral principle cluster is justice which is essentially fairness in access and distribution of resources as proper to a patient (Beauchamp 226). In organ donation this is of utmost importance, because organ transplants are not distributed based on financial ability, race, ethnicity or any other such factor. Organ transplants are supposed to be based on organ compatibility and medical necessity alone.

Head transplantation may be thought to oppose this principle in so far as there is a shortage of organs available for transplant, and as such one body donated for transplant which may have been able to save many lives for different patients that need a heart, a liver, or lungs now is now only used to save one life. In this instance, it may be said that unfair precedence is placed on the one person over many others equally in need. However, in principlism the justice cluster of principles would be weighed against the other three clusters.

Moving on from principlism another moral approach is intuitionism which is essentially the gut feeling of what is right and wrong (Shannon 23). Now this theory is hardly a standalone theory for justifying in the medical field whether a procedure should occur or not, but it is important. The natural law is one which is inscribed upon the hearts of men, and so if the natural law is to be taken seriously then the intuition of what is right and wrong cannot simply be ignored. It is necessary to back this theory with other theories of ethics.

The idea of transplanting a human head onto another body intuitively feels inappropriate. One can rationalize this feeling away, but there may be something to this gut reaction that requires further investigation.

Rights ethics is a very American type approach to ethics. Rights ethics focuses on establishing a “hierarchy of rights” (Shannon 23) or moral claims. In so far as the patient’s rights are looked after than a procedure or treatment is considered morally ethical. This method fails to identify where a patient’s rights come from and whether they are mere constructs of the medical profession or based on an inherent dignity of personhood which transcends hospital walls. Furthermore, if there is an inherent dignity of personhood then where does this dignity come from and does this have any implications.

The rights ethics approach if grounded in a dignity of personhood as defined from the Catholic perspective will necessarily find that human head transplantation by its very nature violates the dignity of the human person and therefore cannot be ethically permissible despite the chance for endured life.

Medicine is concerned with healing the human body, but just as there are many ethical methods there are many perceptions of the human body each of which carries profound implications on determining what is ethical in medical practice. Perceptions of the body typically fall into the categories of body as property, body as gift, and body as self.

The property view of bodies invades the terminology of transplantation with words such as procurement or harvesting (Fisher 187). In the property view of the body, the body belongs to a person whose soul happens to inhabit it. When a person dies the body becomes the property of the next of kin. The body is something to be used, and belongs to a particular person. This utilitarian view of the body permeates our culture today. One of the prime arguments for abortion centers on the idea that a woman is to be in control of her body, and no one can dictate what she does with the body that she owns. The pornography industry also use arguments that center around this concept stating that a person can do what they want with their body and no one has the right to dictate what another does with their body. The property view of the body necessarily takes a Cartesian dualistic approach of body and soul such that the soul is of the highest value, and the body is the slave of the soul. Paul Ramsey was against organ donation outright because he saw it as the effective “reduction of a person to ‘an ensemble…of interchangeable…spare parts’ in which ‘everyone [becomes] a useful cadaver’” (LaFleur 640).

Surgeons get the reputation from some as being almost glorified mechanics of the body. The body can sometimes seem as though it were simply a biological machine; there is an inherent plumbing to the cardiovascular system, an electrical wiring to the neurons, and a multiple lever mechanization scheme to the musculoskeletal system. Medicine is based on assumptions of similarity in anatomy, physiology, and even biochemistry so that treatments can be proposed based on past experience in patients. Our bodies are the products of millions of years of biological evolution, but are they therefore the same as any other organism or as the other views of the body will maintain are they something more to the extent of gift or even self. A notebook with no writing in it and one’s favorite novel are both made of similar material, but the words written in the latter elevate it so as to cause one to cherish it. Perhaps the human body though made of the same material as that of the other animals may be elevated by the presence of a certain indelible mark to something more.

A gift given not out of necessity, but out of love for another should be received with gratitude and appreciation. The view of the body as a gift of which we are “trustees, guardians, or stewards” (Fisher 188) approaches the idea as body as self, but is not equivalent to it. The idea of a person in transplantation re-gifting their bodies in donation gives the impression that we are still distinct from our bodies.

The theologically inclined may be quick to point to Saint Pope John Paul II in his series of Wednesday addresses that came to be known as the Theology of the Body describing “Being as Gift” as the Catholic Church’s support of this approach. However, the Church’s position as it will become evident is that Being is Gift and body is self. This explanation may seem nitpicky, but Being as Gift refers to our entire existence as an embodied person with a spiritual soul, whereas the conception of body as gift while commanding a respect for the body does not view it as necessary to the human person. A short anecdotal story can help illustrate this point; there was an automobile sticker that read “please don’t take your organs to heaven [;] heaven knows we need them here” (LaFleur 627). This sticker was a lighthearted way to say that people should donate their organs, but it also implies in a sense that our bodily organs are something that we simply have but are not actually us. A person’s body after death is a gift in so far as it is a gift of self.

The body as self-view maintains that the body is not something subservient to the person at all, but is the person. In this view “my living body is *me*, it is not some*thing* I own or give; it is the some*one* that I am” (Fisher 189). A person in this view of organ transplantation therefore does not give a body organ to someone in donation, but gives of themselves in donation. This view is the same view as held by the Catholic faith, and is based on the Catholic understanding of dignity and personhood.

Biomedical ethics in order to be properly considered must be based on the dignity of the human person. The Faith and Reason honors program dedicates an entire semester to developing an understanding and appreciation for what it means to be a person and what it means to have dignity by looking at many different perspectives and delving into the basis and implications of each one. Ethics ungrounded in an understanding of dignity and personhood is not sufficient, because stipulations on what is a principle, right, or instinctively good are stated but without any substantial basis as to why they are a principle, right, or instinctive good. There has been throughout the growth of the discipline of ethics a “divorcing [of bioethics] from religion” (Meilaender 21). Thomas Jefferson’s idea concerning the separation of church and state has also somehow permeated most disciplines with the exception of theology such that if a discipline is to stand on its own we try to pull any religious understanding from it. Biomedical ethics in this regard is no exception. The principlism theory of ethics “tends to mask our disagreements on crucial questions about suffering, human dignity, the meaning of death, and the relation of the generations” (Meilaender 19) to boil it down such that it can fashion a “minimal morality for a community of strangers” (Meilaender 18). The principles in principlism have ideals on how to treat and respect a human person, intuitionism based on the sense of what is right and wrong that is reminiscent of the Natural Law, and rights ethics is based on what is proper to a human person. All these theories assume that people are not merely material things, but have some sort of inherent value which necessitates proper treatment. The theories tend to skirt around what the inherent value is. The inherent value in people which necessitates proper treatment is human dignity. There are many understandings of human dignity and personhood such as dignity associated with absolute freedom, dignity as the result of being superior compared to animals due to rationality, or the concept that dignity is simply a social construct. For the sake of brevity this paper will look at what ethics based on the Catholic understanding of dignity and personhood is to conclude regarding human head transplants.

The dignity of the human person according to the Catholic Church comes from being created *imago Dei*, in the image and likeness of God*.* The Catechism of the Church states that “because of the spiritual soul…the body made of matter becomes a living, human body; spirit and matter, in man, are not two natures united, but rather their union forms a single nature” (*Catechism*, par. 365). Spiritual soul is not a redundancy; spirit refers to the element in man that is eternal and so even a derivative of the intellect like an idea written down can exhibit the spirit of man, for the idea of a man can exist long after the man’s earthly existence. Angels are pure spirit, but do not have souls. The soul is the animating principle of a body, and so all non-human animals have a soul, but not a spirit. Man is unique in having a spiritual soul, and the Catechism makes it clear that it is due to this unique spiritual soul that the body of man is thus comprised not only of material but spirit. “The human person is nonetheless inescapable and essentially a *body person”* (May 291). I am not a person with a body, my body is a part of my personhood; I am my body. Therefore, when a person’s body dies the person is also said to be dead. The catechism also says that “the unity of soul and body is so profound that one has to consider the soul to be the ‘form of the body’ (*Catechism* 365). Jesus in His Resurrection did not come back like an angel as pure spirit; rather he came back with his Resurrected body. The Catholic Church recognizes a day in which there will be the Resurrection of our Bodies. The understanding of the Bodily Resurrection is based on the understanding of the human person as both spiritual soul and body, and that Jesus in His Resurrection was Resurrected in spirit and body. John Paul points out in his Theology of the Body discussions that since man is body and spiritual soul and God found man to be good then necessarily the body of man is good. A person is an emodied being with a spitiual soul; dignity is respecting the qualities of a person that make them a person.

The Catholic view of personhood is diametrically opposed to the dualistic view of the person. Dualistic views of the body lead to viewing the body as property or something simply to be used (Fisher 187). The view also tends to assume that “we are our brains” (Blumenthal-Barby, par. 3). However, the question remains what happens when a person no longer remembers who they are due to a degenerative mental illness? Do they ever stop being a person in this view? Personhood in the dualistic view is solely associated with the “continuity of our mental and psychological metaphysical narrative” (Blumenthal-Barby, par. 2). Therefore after a human head transplant if John Smith still feels he is John Smith the dualist would say that the surgery is a success. The “Cartesian formula” (LaFleur 626) of dualism while appealing is still “a fiction [and therefore] still a fabrication” (LaFleur 626). If Jane Doe tried to punch John Smith then John would say Jane had punched her; instinctively the actions of her body are considered the action of her person. Jane Doe is not merely inhabiting a body; she is her body. While it is pleasant to think of us as above our bodies which age and deteriorate with time we are in fact still our bodies. The Fall of Man did not only affect the human person’s spirit, but affected the human person’s body as well.

The understanding of Human Dignity and personhood as the result of us being created in the image and likeness of God and therefore necessitating respect as a person made of body and spiritual soul each of the utmost importance has profound implications on how the Catholic Church views organ transplantation.

The Catholic Church has been an avid supporter of organ donation and transplantation since it first started occurring in the middle of the 20th century. Saint Pope John Paul II said that “‘the progress of medical science has made it possible for people to project even beyond death their vocation to love’” (Fisher 185). Love is projected because in donating one’s body, a person is sharing in who they are and giving part of themselves to another even after they have died. The ‘trans’ in trans-plantation shows the interpersonal nature of a gift from someone to someone else or more accurately an incorporation of one person becoming joined in a bodily union with another (Fisher 186). John Paul also compares “organ donation as Eucharist- as a gift in and through the body” (*On the Ethics)*. A gift is given freely and without obligation. John Paul writes that when it comes to organ donation it is the “absence of an obligation to rescue [that] gives the decision to donate organs its positive moral weight” (Joralemon 31). Jesus’ passion is not celebrated during Holy Week, because it was obligatory. Rather, the fact that God would become man only to die for the sake of all of mankind while necessary for our salvation was not required of God and is the cause for celebration. The absence of obligation that enabled the salvation of man is the same absence of obligation that makes the gift of self in organ donation so extraordinary.

The Bodily Resurrection was mentioned earlier, and so one may naturally ask whether the support for donating organs may contradict with the Church’s understanding with the Bodily Resurrection. The Church as a rule has always maintained that the bodily remains of a person should remain together. Cremation for the longest time was banned by the Church, because of the understanding of the Bodily Resurrection. In 1886, the Catholic Church removed the prohibition on cremation, but maintained the understanding that organs were still to remain together (LaFleur 628). The Catholic Church had to consider whether organ donation in which organs are drastically separated after death would pose a problem for the Bodily Resurrection. The Church upon further examination concluded that the donation of organs would not interfere with the Bodily Resurrection. After a person dies their body is subject to decay, and so a body buried 500 years ago unless it is mummified will typically be fully reduced back to unidentifiable organic matter during present day. A person who was buried 500 years ago is not going to ‘miss’ the Resurrection of the Body just as a person who is cremated is not out of luck. Both the Jewish and Christian faiths have adapted/expanded upon the “traditional ideas of bodily resurrection” (LaFleur 629) with most denominations finding that organ donation should not hinder the Resurrection of the Body.

The Church has been a big proponent of organ transplantation, but also due to its understanding of personhood and human dignity necessarily finds that limits need to be present in organ transplantation so that the understanding is not violated. The aspects of organ transplantation not supported by the Church are not mere digressions, but rather set the stage for discussing human head transplantation. The church supports organ donation, but does not support any donations that could be seen to violate the dignity of the human person. Therefore the default assumption on human head transplantation is that it would be permissible unless sufficient evidence exists that it violates the dignity of the human person. Human head transplantation as will be elaborated upon in the next section does in fact violate the dignity of the human person, and therefore is ethically unacceptable.

One limit of organ transplantation is that organs are never to be bought or sold. “Commodification” (Joralemon 29) in which organs are treated simply as property to be bought or sold would “lead to increasing objectification of the human body” (Joralemon 29). One of the most important questions to address is when does the body-as-self connection end (Joralemon 30) and whether the body will ever become mere property. The answer is that the body even when the spirit has left does not merely revert back to being solely material. Intuitively as a society we understand this and “the corpse [of a person] continues to be treated as integral to the self” (Joralemon 32) as so laws exist against the improper treatment of a corpse and the recovery of remains during wartime or after a tragedy is a matter of utmost precedence.

Organ donation is currently done without any financial reimbursement and no mandate in the United States for the donor, and the Catholic Church believes that these two elements are essential to the process yet many try to overturn these aspects. An organ received as a gift can “make one stuck with the tyranny of being grateful” (Lawler 193), but buying an organ is a close ended transaction. The body in the current system of organ donation is not simply an object to be bought or used, but is a gift from another person and as the body as self-view would say a gift of another person. The Catholic Church does not support the commodification of the human body in any aspect and not just in medicine, because the body as understood by the church is directly correlated with personhood.

There is a shortage of organs in the world for transplantation and an ever growing waiting list of those who could benefit for organs, and so many call for alternate ways of increasing the amount of donors. One method is paying donors which the Church necessarily opposes, but other proposals include assuming consent if there is no listed objection of a donor or their family to organ donation, and there is the outright mandating of organ donation after death. The argument centers on the understanding that the saving of one’s life is a good thing, and so while the means are not necessarily good the ends justify those means. As discussed earlier, Saint Pope John Paul II stated that the positive moral weight of organ donation came from a gift devoid of obligation; therefore mandating organ donation or assuming consent voids the positive moral weight of organ donation. “*Ex integra causa”* is the principle that the “goodness of an act arises from the integrity of all the elements” (Furton 75). The principle coincides with the “Christian precept that one can never do evil to achieve good” (Fisher 202). Violating the gift nature of organ donation violates the whole goodness of the act and so the Catholic church not only opposes the direct commodification of organs as an incentive for organ donation, but also the attempt to remove the free will aspect of organ donation on the part of the donor and his/her family.

The Catholic Church supports organ transplantation in so far as the dignity of the human person is respected. However, what about when non-human organs are transplanted into humans does this violate human dignity and personhood? Xenotransplantation is when tissue from an animal is translated into a human. On this aspect of transplantation the church allows limited xenotransplantation such as “corneal or valve” (Fisher 200) but “remains cautious about any major organ xenotransplantation that might compromise the identity of the tissue recipient” (Fisher 200). A heart transplanted from an animal to a human, therefore would not be ethically sound. However, this issue will not be going away any time soon as a new technique attempts to use pig heart scaffolding scrubbed of its genetic material but seeded with human heart stem cells as a heart for transplantation. This technique will require much ethical discussion and debate, because it is a form of xenotransplantation but utilizes human genetic material.

In order to address whether human head transplantation violates the dignity of the human person it is necessary to discuss the procedure in both forms of the argument; that the procedure is, as the name suggests, one in which the head of a person is being transplanted onto a body and the argument that the body of a dead donor is being transplanted onto a living head. The importance of this discussion is not concerned with mere semantics, but because it is necessary to demonstratively prove that in regards to either distinct understanding of the procedure the dignity of the human person as understood from the Catholic perspective is violated and as such that the procedure is unethical.

Human head transplantation viewed, as the phrase implies, as a transplantation of a head violates the dignity of the human person outright. “The brain is significantly determinative of personal identity, and [so] it has been considered impermissible to procure human brain tissue for transplant” (*On the Ethics* 36). The Church does not support human brain tissue donation, because it is understood that the brain is particularly “determinative of personal identity” (*36)*. The body is made of body and spirit, but the brain is unique in being the house of human reasoning and so is a major component of personal identity. Human transplantation invokes not only transplanting some brain tissue, but removing an entire brain from one person to put on the body of another person. The transplantation of any brain matter is non-permissible, and so if the procedure is thought of as transplanting a head onto a body, then the Catholic Church has already in its verdict on the impermissibility of transplanting tissue of the brain has already stated in essence that head transplantation is also nonpermissible. The counter argument that human head transplantation is actually a misnomer and the procedure is really a body transplant while requiring a more in depth conversation still reaches the same conclusion that the dignity of the human person is violated in the procedure.

The categorization of the procedure as a body transplant is logical in so far as the body donated comes from a person who is considered according to the Catholic Church to be dead. Medicine for centuries has associated death with the cessation of the cardiovascular system for a period of time after which recovery was not possible. However, the appearance of artificial life support muddled the understanding of the determination of death, and so had to be reevaluated. The question was not solely of theoretical value, because the Catholic Church teaches that donation of life sustaining organs such as the heart, liver, and lungs should only be donated by a dead donor and never a live donor. There would have been profound implications should the Church have found that only those found to have died according to the cardiovascular determination of death were truly dead, because that would have meant that organs could not be removed from patients that were found to be brain dead who had a functioning although artificially supported cardiovascular system.

Saint John Paul II defined the moment of death as when “‘ the spiritual principle which ensures the unity of the individual can no longer exercise its functions in and upon the organism, whose elements, left to themselves, disintegrate’” (May 287). John Paul elaborated further on the principle explaining that “‘the death of a person is an event which no scientific technique or empirical method can identify directly’” (Schwarz 566). Time of death as announced by a doctor therefore is not in reality an accurate phrase. A doctor is really announcing the time at which it is evident that death has already occurred not the moment that is has happened. A human person is body and spiritual soul in complete union and so when the spirit leaves the body a person is dead. Artificial life support led to the question as to whether another criterion for establishing if a person has already died beside cardiovascular cessation would be permissible. John Paul had the Pontifical Academy of the Sciences evaluate whether an alternate criterion may exist, and it was determined that the occurrence of death is also evidenced by “irreversible cessation of all brain functions” (Haas 5). John Paul II supported their assessment. In 2008, the Pontifical Academy of the Sciences for the third time backed the neurological criterion for death (Schwarz 566). The neurological criterion for determining death has been not only accepted by the Pontifical Academy of the Sciences and Saint Pope John Paul II, but at least seven other entities of the Church including various Councils and Bishop Conferences (Hass, par. 7).

While the Church has reaffirmed on numerous occasions that the neuroglial criterion of death is acceptable there has been stringent objection by some Catholic doctors in the medical field. However, the Church continues to voice their confidence in the criterion and while the teaching is not irrevocable, the Church maintains that a doctor can in good conscience determine that death has occurred by prudently using the neurological criterion.

The theologian at this point may begin to develop some very perturbing questions. One of the most perturbing being, if donor organs are from a deceased person and death is when the union of spiritual soul and body is disrupted does the body maintain its value as self after death? The body of a deceased person is allowed to be cremated as mentioned earlier, because the person is dead. However, in organ transplantation there is discussion of the gift of one person becoming incorporated into another person. Personhood as we defined it is an embodied spiritual soul which no longer is in union at death, so can organs from one that is truly dead be considered a gift of one’s person to another. Furthermore, does this mean that a kidney for example from a live donor would contain an aspect of the donor’s spirit while the kidney from a brain dead patient would not? Xenotransplantation of major organs is not allowed, because while animals contain an animating soul they do not contain a spirit. An organ from a dead donor is allowed in so far as the organs are uniquely human, but since death is a detachment of spiritual soul from body how can the organ be even said to be uniquely human if a human person is necessarily an embodied spiritual soul. The pragmatic rhetorician may have been inclined to remove or obscure these questions, because to answer these sufficiently an entire theological doctoral thesis would have to be written. It is much easier to construct false solutions than to discover the truth, but in pursuit of the truth it is necessary at the very least to touch on these questions. A tentative and albeit rough understanding regarding this issues is that brain death is indicative of the death of a person. Transplanted organs which are comprised of living cells contain the animating element of soul. Spirit is the element of man which continues after his death, and so the willing of one’s organs to another through the decision to donate contains a degree of spirit. As a result, the donation of an organ seems to be a sort of gift of personhood that arises even after the death of a person himself.

The death of the donor and the respective body has been discussed thoroughly, but the major weight of the argument against human body transplantation regards the living person. The reason that the separation of the ‘body’ from the head of the ‘body recipient’ does not also mean that he too is dead is that the brain does not cease in brain activity and circulation to the brain never ceases for enough time to meet the circulation death criteria. Neither indicator of death therefore has occured. Furthermore, the head is material, so it’s not as if the spiritual soul was split from the body.

A person who loses an arm or a leg is not thought to have their personhood deducted from them, and heart transplantation from one person to another is also permissible, and so it is tempting to say that a head transplant is no more than just another transplant. However, this is not the case. A man is to be “respected in his body as in his soul, in the integrated totality of his spiritual body being” (Furton 85). The body of a living person as it has repeatedly ascertained is the person himself and so should be respected in his body as much as in his soul. The body furthermore should be respected in its own totality and integrity (Furton 85). Totality is “directed towards the preservation of the physical whole” (Furton 85). A heart transplant occurs because the heart is not working, but it would be inappropriate to transplant a kidney and a heart to someone who only needs a heart. In the *Summa Theologicae,* St. Thomas Aquinas in discussing parts of the body says “If… a member is healthy and continuing in its natural state it cannot be cut off to the detriment of the whole” ( Furton 85). Respect for the human body is respect for the human person, and so any attempt to remove or detract from the human body or replace functional aspects of the human body violates the dignity of the human person.

People with diseases such as ALS, cancer, or other forms of muscular dystrophy have well-functioning elements of their bodies from the neck down. A human head transplant does not address the root issue of their problems, but instead avoids addressing the actual problem such as combating a neurological disease in ALS, a defective gene in muscular dystrophy, and uncontrolled cell growth in cancers. A new homeowner may move into a house that has defective wiring, one approach is to attempt to fix/replace the defective wiring, however an alternate approach is simply to buy a new house. Buying a new house may be considered reasonable in so far as the wiring may cause the ultimate destruction of the whole house, but the body is not merely a material house. The body is not to be distinct from us, but rather is us. It is not proper to the human person to discard of significant amounts of healthy functioning aspects of themselves irrespective of the threat of death.

Furthermore, in a body transplant not only is the totality of the body not respected neither is the procreational identity of the person. The Church has consistently opposed surrogacy, in vitro fertilization, and any other attempt to separate procreation from the union of two persons inside the martial bond as an expression of love. In a body transplant any offspring of the body recipient would have the genetic identity of the body donor, and so the procedure would violate the procreational identity of the recipient. Body transplantation is opposed by the Catholic Church “on the grounds that [it] undermine[s] personal and procreational identity, uniqueness, and dignity” (Fisher 212).

The proverbial devil’s advocate at this point may say that death is the ultimate indignity to the human person since it is the point where there is separation of body and spiritual soul. Even though a human head/body transplant from either perspective may violate personhood of the individual it does not do so in greater degree than death. One person is already dead. Why make it two? Saint Pope John Paul II himself stated that “‘although in the flesh he is mortal, he also realizes that he ought not die’” (May 287). However, while the point is valid that death is in a sense an indignity to the person, and is resultant of the Fall of Man; the indignity of death has already been overcome in a sense. “The victory over death has already been won by Christ and will never be won by medical researchers” (Furton 8). Sin alone prevents eternal life “not blocked arteries” (Furton 8). A question is often phrased as to how much of a person can be removed/replaced before the person is no longer a person. The answer is not in terms of quantity but rather intention. A person ceases to be a complete person when they violate their own human dignity. Human dignity is violated when the totality of the functioning aspects of the whole body is not respected. Every human being will experience death, but in the Resurrection of the Body each person will also experience rebirth; to try and avoid death by violating human dignity is of much greater consequence than experiencing death prematurely. Medicine seeks to keep us alive, but it is the duty of ethicists and the Church to ask at what cost.

The average life expectancy is on the rise, and as such the inevitability of death keeps being pushed back as a whole. Peter Lawler once wrote that “the more we push back the necessity of death, the more accidental death becomes” (Lawler 19). It is true that in a world which increasingly denies God and a purpose for human existence, that we are striving harder than any generation before us to keep our existence going. There is a loss in confidence in eternal life, but the resistance to the end of our existence still thrives and is growing. Instead of being concerned with securing eternal life with God the focus shifts into extending our lives by twenty or thirty years at any cost. Lawler goes on to write that “to the extent our dignity depends on securing freedom from nature, we will remain undignified” (Lawler 32). Lawler is not proposing a hopelessness in which not only should medicine not do human head transplantation but the practice of medicine should cease altogether. Rather, Lawler is saying that death is not to be thought of as the ultimate evil, for violating human dignity in order to delay death is much more disastrous than death itself.

Death is the natural end of the fallen body, but there is hope in that death is not the ultimate end of our existence and that the dignity of the human person will be fully realized in the Resurrection of the Body. Human head transplantation discards the body in so far as the body threatens us with death just as other limitations of the body are often undermined when they are contrary to what we would desire. For example, there has been a “methodical disconnecting” of sex from our bodies in which we attempt to limit or undermine the reproductive potential of our bodies (Lawler 20). There is a drive for full autonomy but we are in bodies, or more accurately we are bodies with all the “limitations [that] it imposes” (Lawler 78).

1. **Resolution**

Human head transplantation according to the perspective of principlism satisfies, for the most part, the principles of autonomy and beneficence. Autonomy is satisfied in so far as the patient has been made fully aware of the consequences of the procedure and decides to undertake the elective operation. The principle of beneficence is satisfied since the intent is for the patient to avoid the effects of a life-threatening illness. The principles of nonmalefiance and justice are not satisfied completely. The surgery contains many risks and has side effects that are high in both nature and degree. The principle of justice would seek to maximize the distribution of a donor body’s organs such that the greatest number of people would be able to survive and not put precedence on the one recipient. As long as death is viewed as the ultimate evil, principlism would find that the procedure is justifiable. However, based on an understanding of the dignity of the human person from the Catholic perspective principlism would find that the procedure is not ethical. There is a greater degree of harm occurring from the violation of human dignity than the benefit of delaying death.

The intuitional perspective of bioethics is based on the gut reaction to a procedure. The initial response to hearing about the procedure tends to be of concern/ dismay. The Natural Law is said to be inscribed upon the hearts of man and to be primordial like a gut reaction. The understanding of the Catholic Church on human dignity relies heavily on the Natural Law, and so the uneasiness that one feels upon the initial exposure to this topic make sense in light of the understanding that human dignity is being violated as a result of the procedure.

Rights ethics often coincides with autonomy. However, when rights ethics are based in human dignity it is to be understood that human dignity is the basis for one’s rights. Therefore, any affront to human dignity can never be considered a right.

Each of the three bioethical approaches grounded in the Catholic understanding of the dignity of the human person necessarily concludes that human head transplantation is unethical.

1. **Conclusion**

The concept of head transplantation is realistically within the realm of possibility. The question is whether such a procedure even if medically possible is ethically sound. There are many ethical approaches to medicine. Of the major theories of principlism, intuitionism, and rights ethics the question remains where do the principles, intuitional understandings, and rights present in these theories find their basis. The grounding point in each ethical approach is an understanding of the dignity of the human person.

An understanding of the dignity of the human person is not an easy question to address, and as such many ethicists seem to avoid discussing such matters. This paper chose to address the Catholic understanding of dignity and what it means to be a person as *imago Dei.* The understanding of a person as a being created in the image and likeness of god as an embodied person that is one of both spiritual soul and body has profound implications on our understanding of human head transplants. Human head transplants violate the very dignity of the human person and as such cannot be found to be ethically permissible.

The goal of biomedical ethics is not to hold back medical progress, but to address whether medical progress truly is progress. The premise behind yesterday’s Frankenstein novel may very well become tomorrow’s reality, unless medicine as a discipline and we as a society finally take the time to reach an understanding of what it means to be a person and the implications resulting from those conclusions. One such approach is the Catholic understanding of personhood and dignity which necessarily will conclude that such a procedure would be unethical.

Bibliography

Beauchamp, Tom L., and James F. Childress. *Principles of Biomedical Ethics*. 5th ed. Oxford: Oxford UP, 2001. Print.

Berko, Lex. *A Monkey Head Transplant*. *Motherboard*. Vice Media LLC, n.d. Web. 8 Mar. 2016. <http://motherboard.vice.com/blog/dr-robert-white-transplanted-first-monkey-head>.

Blumenthal-Barby, J. S. "Head Transplants, Personal Identity, and Derek Parfit." *Bioethics.net*. The American Journal of Bioethics (AJOB), n.d. Web. 20 Feb. 2016. <http://www.bioethics.net/2015/03/head-transplants-personal-identity-and-derek-parfit/>.

Canavero, Sergio. “HEAVEN: The Head Anastomosis Venture Project Outline for the First Human Head Transplantation with Spinal Linkage (GEMINI).”*Surgical Neurology International* 4.Suppl 1 (2013): S335–S342. *PMC*. Web. 8 Mar. 2016.

Čartolovni, Anto, and Antonio G. Spagnolo. “Ethical Considerations Regarding Head Transplantation.” *Surgical Neurology International* 6 (2015): 103. *PMC*. Web. 8 Mar. 2016.

*Catechism of the Catholic Church*. 2nd ed. Vatican: Liberia Editrice Vaticana, 2000. Print.

Fisher, Anthony. *Catholic Bioethics for a New Millennium*. New York: Cambridge UP, 2012. Print.

Christensen, Jen, and Elizabeth Cohen. "The 'Most Extensive' Face Transplant in History Gives Firefighter New Life." *CNN Health*. CNN US Edition, 16 Nov. 2015. Web. 2 Apr. 2016. <http://www.cnn.com/2015/11/15/health/face-transplant-firefighter/>.

Furton, Edward James, ed. *Ethical Principle in Catholic Health Care*. Boston: National Catholoic Bioethics Center, 1999. Print.

Haas, John M. "Dr. Haas Discussed Neurological Criteria for Determining Death." *Catholic News Agency*. Catholic News Agency, 3 May 2011. Web. 20 Feb. 2016. <http://www.catholicnewsagency.com/column/dr-haas-discusses-neurological-criteria-for-determining-death-1575/>.

*Head Transplant Surgery - Full Tedx by Dr. Sergio Canavero*. *Youtube*. N.p., 11 Apr. 2015. Web. 20 Feb. 2016. <https://www.youtube.com/watch?v=FmGm\_VVklvo>.

"Italian Doctor to Do First Head Transplant in China." *The Local IT*. Local Europe AB, 11 Sept. 2012. Web. 2 Apr. 2016. <http://www.thelocal.it/20150911/italian-chinese-team-to-perform-first-head-transplant>.

Joralemon, Donald, and Phil Cox. "Body Values: The Case against Compensating for Transplant Organs." *The Hastings Centers Report* 33.1 (2003): 27-33. Print.

LaFleur, William R. "From Agape to Organs: Religious Difference Between Japan and America In Judging the Ethics of the Transplant." *Zygon: Journal of Journal of Religion and Science* 37.3 (2002): 623-42. Print.

Lamont, Tom. "'I'll Do the First Human Head Transplant.'" *The Guardian*. Ed. Katharine Viner. Guardian News and Media, 3 Oct. 2015. Web. 20 Feb. 2016. <https://www.theguardian.com/science/2015/oct/03/will-first-human-head-transplant-happen-in-2017>.

Lantieri, Laurent A. "Face Transplant: Learning from the Past, Facing the Future." *Proceedings of the American Philosophical Society* 155.1 (2011): 23-28. Print.

Lawler, Peter Augustine. *Modern and American Dignity*. Wilmington: Intercollegiate Studies Institute, 2010. Print.

May, William E. *Catholic Bioethics and the Gift of Human Life*. N.p.: Our Sunday Visitor, 2000. Print.

Meilaender, Gilbert C. *Body, Soul, and Bioethics*. Notre Dame: U of Notre Dame P, 1995. Print.

*On the Ethics of Organ Transplant: A Catholic Perspective*. N.p.: Ascombe Bioethics Center, 2014. Print.

Schwarz, Ernst R., and Salvatore Rosanio. "Religion and the Catholic Church's View on (Heart) Transplantation: A Recent Statement of Pope Benedict XVI and its Practical Impact." *Journal of Religion and Health* 50.3 (2011): 564-74. Print.

Shannon, Thomas A. *An Introduction to Bioethics*. 3rd ed. Mahwah: Paulist Press, 1997. Print.