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Attitudes on Medical Ethics of Criminal Neurointerventional Treatment

Haley Whitaker

A Senior Thesis submitted in partial fulfillment
of the requirements for graduation
in the Honors Program
Liberty University
Spring 2018

Acceptance of Senior Honors Thesis

This Senior Honors Thesis is accepted in partial fulfillment of the requirements for graduation from the Honors Program of Liberty University.

Elizabeth Sites, Ph.D.
Thesis Chair

Jichan J. Kim, Ph.D.
Committee Member

Robert Van Engen, Ph.D.
Committee Member

Marilyn Gadomski, Ph.D.
Assistant Honors Director

Date

Abstract

As contemporary scientific advancements offer the opportunity to manipulate processes of the human body at a higher degree of invasiveness than ever before, a number of bioethical concerns are raised. One significant concern is how to discern the acceptable integration of advancements in neurologically-based interventions into the criminal justice system. Past literature supports the idea that there are several variables that interact to form a global conversation on the ethics of compromising a criminal's freedom of mind for the purposes of sentencing or rehabilitation. Attitudes toward the current criminal justice system and the current uses of neurointerventions are significantly influential, and the public attitudes of such topics have been well-recorded through the literature. An experienced physician was interviewed in order to gain the perspective of a professional who regularly implements neurologically-based treatments. The results of the interview suggested that professionals have a moderate level of confidence that the current relationship between the criminal justice system and neurointerventional methods has generally remained within ethical boundaries. The results also suggested that medical practitioners are tasked with balancing the dignity and the safety patients, which can cause frequent ethical dilemmas. The varying responsibilities of medical professionals keep them equipped to implement expert-level care while simultaneously considering the ethical ramifications of their decisions.

Keywords: bioethics, criminal justice, neurointerventions, mental integrity

Attitudes on Medical Ethics of Criminal Neurointerventional Treatment

The augmentation of human abilities and/or function is referred to as bioenhancement. Progress in this area is limited by human technological advancement, and has consequently seen centuries of slow growth, reflecting the advancements of the corresponding eras. The ethics regarding developments in bioenhancement are increasingly difficult to manage with time. The rapid pace of developments occurring recently exceed the pace at which a consensus can be reached as to what kind of parameters there should be on such advancements. When individuals are given the power to control factors such as certain social nonconformities, the most important question becomes *if* humanity should be curing these factors, and not solely *how*. Past research has been conducted that has focused on specific instances of innovative technological and/or scientific developments (Cherek, Lane, Pietras, & Steinberg, 2001; Stinneford, 2005; Surmeli & Ertem, 2009). The scope of the impact of bioenhancement is enormous, which makes it necessary to delve into the ethics of the more specific issues. There is an ethically ambiguous impact of advancements in neurointerventions that are utilized to treat criminals in their process of rehabilitation, both forcefully and voluntarily.

Scientific discoveries made in recent years have led to a greater understanding of the neurotransmitters and hormones that make humans feel, think, and act (Bechara & Van Der Linden, 2005; Coccaro, Lee, & Kavoussi, 2009; Cools et al., 2005; Koenigs et al., 2007 Stinneford, 2005). In turn, this increased knowledge has also allowed for greater opportunities to manipulate these neurotransmitters and hormones. In relation to the criminal justice system, some states have begun to accept psychopharmacological or neurointerventional sentences for some crimes. Several states have allowed for chemical

castration through the use of a hormone naturally found in females, administering high amounts of the hormone to reduce a male sex offender's testosterone production level to minimal levels (Stinneford, 2005). The criminal justice system is being revolutionized by new treatment options such as this, and is therefore creating room for new discussions on the ethics of possible sentencing for violent offenders around the globe.

As a consideration of appropriately placed ethical boundaries leans more into philosophical territory rather than empirical territory, there has been a wide variety of publications relating to this topic (Bublitz, 2016; Christensen & Gomila, 2012; Raine, 2013). The numerous facets within this discussion must be addressed to gain a fuller understanding of the arguments being made. There are several factors that collectively form an individual's convictions about the ethics of innovative methods of neurotherapy. These factors include topics such as beliefs regarding free will and consent, public attitudes formed over a lifetime of conditioning, and limited access to information regarding the criminal justice system. Additionally, past studies have produced differing results when data are gathered in separate years or in separate locations or with distinctive measures. This results in the varying range of published results within the studies that span the entirety of the distinct factors to be taken into consideration. In short, there is a significant amount of content to address and thoughtful considerations to be taken if any attempt is to be made in order to uncover the general attitudes of medical ethics related to criminal justice.

Past Considerations of Treatment Methods and Ethical Values

Advancements in Treatment Methods

Varying treatments for violent criminals or sexually violent predators have arisen in recent years, due to scientific advances that allow experts to better understand more of the mechanisms within the central nervous system. Some rehabilitative techniques for violent offenders value the autonomy of the individual and one's capacity to regain prosocial behaviors, such as the Good Lives Model (Fortune, Ward, & Willis, 2011). However, new innovations in the field of neuro-correctional technology take approaches that are significantly less mindful of the criminal's free will. By studying the internal processes that work so intricately to allow for normal human functioning, humanity has now gained the ability to manipulate the body so well that several questions covering the related ethics and morals have been published (Bublitz, 2016; Carlsmith, 2006; Dawson, 2015; Stinneford, 2005).

There have been several studies that have exhibited progress in using neurointerventions to alter antisocial or dangerous behavior. Neurofeedback (NFB) is a type of neurotherapy that has shown positive results on subjects who have displayed habitual negative behavior (Surmeli & Ertem, 2009). NFB allows subjects to view their brainwaves in real-time using an EEG. This technique helps them to be conditioned over time to learn to control the aggressive emotions causing the results they are witnessing on the EEG. A similar type of neurotherapy is being studied that involves real-time functional magnetic resonance imaging (rtfMRI) being used to help individuals learn to target their problematic behaviors and gradually reduce them over time with practice (deCharms, 2007). This self-regulatory style of neurointervention is not as controversial

as others, likely due to the active role of the subjects involved. However, it does exemplify this new ability to carefully manipulate the processes of the brain to reverse maladaptive behaviors.

Other attempts to reverse these behaviors do not involve nearly as much active participation of the subject. Androgen deprivation therapy (ADT), usually used to treat prostate cancer, is a mandatory sentencing in a few states for some sexual offenders (Focquaert, 2014). The effects of hormonal treatments are more severe to the human body and considerably less of an autonomous decision by the offender, making ADT more controversial in the quest to rehabilitate criminals. Medroxyprogesterone acetate (MPA) is a hormone originally synthesized to treat abnormal bleeding in a woman's uterus that has been alternatively used as an antiandrogen when used on males, reducing their testosterone production to pre-puberty levels (Stinneford, 2005). This treatment is effective for the intended goal of discouraging sexual predators to return to their crimes, but severely deprives males of testosterone production, which is largely attributed to normal male functioning. This, as well as the disputed safety of this treatment method, has caused some to call ADT into question (Greely, 2012).

The common goal of the varying forms of criminal sentencing is to target the aggressive nature of the offenders. Consequently, much research has been conducted to create a more comprehensive picture of the internal processes that lead to aggression and impulsivity. One study revealed that inhibiting serotonin reuptake in the brain using paroxetine led to a decrease in aggressive behavior from former criminals, suggesting increased serotonin plays a part in preventing negative behavioral patterns (Cherek et al., 2001). Another serotonin reuptake inhibitor called fluoxetine showed similar anti-

aggressive effects when tested against placebos (Coccaro et al., 2009). Other studies have reported on the role of tryptophan depletion to negatively affect serotonin production and in turn increase impulsivity within tested subjects (Cools et al., 2005). Though some studies are finding that the relationship between the presence of serotonin and prosocial behavior may be more complex than previously thought, other studies are still being produced that support a strong relationship between serotonin enhancement and positive moral judgment (Crockett, 2009; Crockett, Clark, Hauser, & Robbins, 2010). With several studies supporting the prosocial effects of serotonin in the human body, more treatments may become available for criminals that specifically target and alter their serotonin production.

Research on the processes behind decision-making has been vital to the endeavor of rehabilitative treatments as well. A study from 2010 manipulated the right temporoparietal junction (RTPJ) within the brain using transcranial magnetic stimulation (TMS) to test the connections between the RTPJ and mental reasoning and moral judgments. The results of the study found that the interference of RTPJ functioning led to a distinguishable change in subjects' moral judgments and a decreased aversion to harm (Young, Camprodon, Hauser, Pascual-Leone, & Saxe, 2010). Other researchers produced results that supported the connection between the ventromedial prefrontal cortex (VMPC) and impulse control and moral judgments, finding that damage to the VMPC significantly alters an individual's beliefs of right and wrong (Bechara & Van Der Linden, 2005; Koenigs et al., 2007).

Another factor that has contributed to the understanding of decision-making skills is gauging an individual's propensity for addictive behaviors to different stimuli. In

relation to addictive behaviors, one study found that the nucleus accumbens played a role in opioid addicts' likelihood of relapsing, displaying how lesions to the nucleus accumbens led to positive growth of functional health and a decreased likelihood to relapse (Zhao et al., 2012). However, many parts of the brain have been connected to impulsive violence, but have also been sometimes viewed as a kind of addiction (Stahl, 2015). The comprehensive knowledge scientists have now gained regarding addiction, prosocial and antisocial behaviors, and decision-making opens many new pathways to gaining control over brain function. Those who overtly display what are considered to be maladaptive behaviors can be selectively controlled through treatments created to target the areas of functioning that have been researched thoroughly. These developments have raised many ethical questions regarding their usage in the contemporary criminal justice system.

Ethical Issues and Free Will

The future innovations of this field may very well continue this trajectory into ethically ambiguous territory. As scientific advancements lead to an entirely new generation of treatment methods, there must be discourse on the practical constraints of such treatments that matches the pace of the ever-increasing advancements (Epperson et al., 2014). Legal consideration must be taken as well, as the neurointerventional techniques and their corresponding ethical concerns are all in response to the need for appropriate punishments, prediction, and prevention in the criminal justice system (Glenn & Raine, 2014). The more controversial uses of neurotechnology, such as ADT or serotonin manipulation, are practiced with the intention of punishing or rehabilitating criminals, which is something greatly depended upon by society to promote justice and

peace. However, when attempts to achieve effective prevention of criminal behavior infringe upon mental integrity and diversity, significant ethical and moral issues are raised. Technological advancements in any area can initiate this foundational debate about whether efforts to reach an ideal society increasingly disregard respect for one's own autonomy (Shniderman & Solberg, 2015).

One of the most pressing questions prompted by the use of neuro-correctives is whether they may be considered an unethical invasion of thought. Free thought can be related to the idea of free will, agreeing that a person can autonomously adopt beliefs and values by using their own, uninhibited mental capacities (Bublitz, 2016). Free will is commonly regarded as a protected human right, especially in the United States where the Declaration of Independence has claimed the freedom to exercise the inalienable right to life, liberty, and the pursuit of happiness. Some argue that with consent, individuals have the additional right to undergo treatments that interfere with their natural state of mind. As offenders are allowed to take anti-psychotic drugs to return to a mental state stable enough to stand trial, some use this as grounds to broaden this opportunity for other criminal cases (Pugh & Maslen, 2015). Additionally, it has been argued that prison sentencing itself can be viewed as an invasion of free thought, and therefore gives ground for other biologically-based sentencing (Petersen & Kragh, 2016). Similarly, others argue that there is a logical base for excluding authenticity from the factors necessary to respect autonomy (Bublitz & Merkel, 2009). This thought is equally as valid as its opposition which believes that inducing a synthetic state of mind is unethical and a violation of the human right to one's free mind (Bublitz, 2014). Some stand by the belief that without the personal liberty to one's own mind, many moral laws would become inconsequential

(Craig, 2016). There is no consensus on what rights are truly inherent to an individual regarding the invasion of freedom of thought, either with or without consent.

Though there may be no consensus on what is right and what is wrong, there have been attempts to discover public attitudes toward issues of medical ethics. Tobia's study from 2016 provided vignettes to participants in order to gain information on the ways in which people perceive cognitive changes within an individual as a result of brain surgery. The study found that the general population perceives cognitive improvements as the result of surgery to be more identity-preserving while cognitive declines are perceived in a much more negative light. The relevant meaning of those findings is found in the implication that society at large will likely not be opposed to technological advancements that improve one's intelligence or abilities, regardless of the degree to which it interferes with one's natural bodily processes. This is an understandable phenomenon for a society that ever strives to improve and to compete. Another study took this issue to the people, seeking insight into the public opinion of legally enforced neurointerventions. Vignettes were used to gauge people's reactions to a hypothetical situation in which a criminal could choose to take a pill that would alter factors of his personality while granting him a shorter time in prison. The results of the study supported that people are generally not opposed to coerced biological interventions if there is no significant risk to the health of the criminal, even at the cost of a substantial personality change (Berryessa, Chandler, & Reiner, 2016).

As some real-world criminal justice cases have actually offered early release as an incentive for compromising one's bodily integrity, another ethical issue is raised (Ryberg, 2012). Though some argue that bodily integrity takes precedence whether the reason for

the interference is for the bettering of society or not, the role of consent is still debated (Douglas, 2014). There is much dispute over the ethical implications of using incentives to gain consent, as it frustrates the already complex discourse over the ethicality of giving the treatments at all. There are some researchers who assert that an appropriate offer to give neurological treatment is in the good interest of the criminal's autonomy, and is an acceptable option for the future of criminal justice and rehabilitation (Bomann-Larsen, 2013). Others claim that even without consent, a neuro-corrective treatment that is significantly effective to treat maladaptive behaviors with low opportunity cost is the most desirable situation and morally justifies the act of coercive bodily invasion (Pugh & Douglas, 2016). The general intent of neurointerventions is largely to return the normative behaviors expected of the public, which is acceptable in theory but also produces ethical concerns (Vincent, 2014).

Concerns of medical ethics in the field usually are presented during times of normative uncertainty. In these situations of normative uncertainty, a term which refers to dealing with unique problems that require ethical considerations, researchers have investigated some of the perspectives of those experiencing ethical dilemmas (Grunwald, 2012). One study conducted in Israeli hospitals found that when nurses were confronted with significant ethical dilemmas while on the job, there was a negative correlation between the skills and experience of the nurse with the frequency of ethical dilemmas. For the nurses who handled those situations in ways that increased personal distress, the perceived quality of care decreased (DeKeyser Ganz & Berkovitz, 2012). Illustrated through the findings of that study, the goals of individuals who find themselves in a hospital (be it nurses or patients) wish for efficient, quality care that respects their person.

Other studies claim that there are certain standards that must be adhered to in medical practice, such as a clear respect for human dignity, informed consent, complete participant autonomy, beneficence, and equity (Artal & Rubenfield, 2017; Kuritzkes, 2016).

These standards and priorities illuminate human nature in unique ways. Ethical dilemmas are windows through which human nature is seen more clearly, and conflicting convictions regarding those dilemmas give significant insight to human psychology (Christensen & Gomila, 2012). Though people's interpretations of ethical solutions may differ, the underlying motivations that drive humans tend to all center around the same ideal—the desire to strive for good. A caveat must be added that this is not totally generalizable, but for many the ultimate reason someone chooses to be for or against invasive or coercive interventions is because they believe it to be the most beneficial to patients in need. This has been demonstrated in several different ways. At a foundational level, a framework has been created that keeps researchers accountable to share all health-related data, designed to promote responsible research and its due release to others in the medical community and around the world (Knoppers, 2014). Several rationales have been discussed in the literature regarding the integration between scientific research and society, all of which conclude that there is a part of science that is accountable to keep up with contemporary social issues (Glerup & Horst, 2014). Compassion has been another facet of research that is consistently integrated into practice, as it wields the abilities of strength and humility in order to reveal the best of humanity—if utilized alongside discernment and wisdom. Compassion is the unique human factor that further

complicates this question of whether a figurative line exists beyond which the human experience should be manipulated no further. (de Zulueta, 2015)

Some individuals use slippery slope arguments to defend positions against practices that test ethical limits. However, that type of argument has been discussed in the literature as a valid but limited perspective that may be understandable in some ways but is too generalizable to be held to all advancements. The underlying assumption behind such a perspective is that the subsequent generations will use current advancements in a corrupt fashion, a thought that can spur much philosophical debate on its own. Nevertheless, the main argument itself on the ethical parameters regarding freedom of mind and of body is still in great need of philosophical discussions in order to set down any kind of reasonably accepted laws and practices (Douglas, 2014). It has been observed that this process of reconciling laws with scientific advancements has been disconcertingly slow and filled with tension (Shapiro, 2017).

Recent Considerations of Ethical Boundaries

In many criminal justice cases, the protection of the individual takes precedence, or at least that value is *expressed* to be priority (Dawson, 2015). A 2006 study found that a significant percentage of participants actually valued retribution information over information about the effectiveness of a given treatment for offenders of serious crimes (Carlsmith, 2006). Though not always the case, it is apparent that appeals to emotion can be made to alter how people perceive invasive treatments to be acceptable solutions to criminal justice. Obviously no system is perfect, not even worldwide medical practice. As a result of this, free will can be violated. However, this thought only applies if one believes in the concept of free will in the first place. Some have taken on an

epiphenomenalistic perspective in the discussion of free will (Sinnott-Armstrong, 2014).

The tenets of epiphenomenalism hold that physical events in the brain are directly causal to behavior—ultimately what is viewed as autonomous decisions. This consequently

deems that those autonomous decisions are not in fact a product of one's own volition,

but of involuntary physical impetuses. From the perspective of an epiphenomenalist,

humans lack free will and are therefore not capable of making their own moral decisions.

This argument deals with the question of whether humans are actually responsible for

their own actions, a challenging theory that still exists in the public discourse. In a vein of

this thought, proponents of the biosocial model of human behavior put forth that what

others call “free will” is the result of a complex relationship between one's physiology

and environment (Raine, 2013). An individual's exposure to a number of factors in

childhood may even contribute to future behavior, suggesting that free will is not free at

all, but is instead the cumulative instincts that result from a lifetime of conditioning. For

many others, however, free will is very much real and in definite need of further

discussion on its parameters and allowances. The freedom to fall, freedom of will, and

freedom of mind are the three main points of argument that stir up the bulk of the

controversy (Bublitz, 2016). Even those three freedoms may not be totally compatible

with one another. It can be said that neurointerventional methods alter emotions, and so

invasive methods such as serotonin manipulation may offer freedom from maladaptive

emotions, which is construed by some to be freedom of mind. However, that same

treatment could be considered a clear violation of both the freedom to fall and the

freedom of will. This was displayed in one study from 2012 that observed the effects of

anterior temporal lobectomies on epileptic patients, a treatment that offered them freedom

of mind but resulted in significant complications dealing with altered psychological, behavioral, and social patterns (Gilbert, 2012).

Now the medical community, being confronted with effective treatments that may alter the identity of its patients, must weigh these possibilities and discern where its values lie. When these values are made clear, discrepancies can be seen at times between medical practitioners and their patients, which may lead to tension. Patients have been found to value freedom, safety, and respect most, while the values of hospital staff center around life and health (Valenti, Giacco, Katasakou, & Priebe, 2013). For others, personal autonomy is an undeniable top priority. The argument by these individuals is quite opposite from the epiphenomenalistic view, claiming that even in cases of serious drug addiction, an individual is capable of taking effortful steps to help himself or herself and avoid coercive treatment (Uusitalo & van der Eijk, 2015). Evidently, the discourse on free will is extensive, not only considering the facets and allowances of free will, but also the existence of free will at all.

Ultimately, the precedents already set regarding the protection of ethics in science have been encouraging. Those caring for mentally or physically abnormal clients have a duty to protect (Knoll, 2015). Around the globe, the Brussels Declaration was recently formulated and enacted in order to enhance standards of integrity dealing with scientific and societal policies (Kazatchkine, Kinderlerer, & Gilligan, 2017). Others have popularized the concept of performing a risk-cost benefit analysis, a process that ensures the benefits of an endeavor offset the risks involved (Shrader-Frechette, 2012). This can be applied to any study or proposed medical practice that stirs controversy over ethicality. Finally, the Eighth Amendment of the United States Constitution is a crucial force in

regulating the integrity of the personal dignity of its citizens. Though seen as somewhat vague and up for interpretation by some, the core principle of the Eighth Amendment is that humans are protected from cruel and unusual punishments (Stinneford, 2005). For U.S. citizens, this is a mitigating factor in the progression of this persisting debate over personal freedoms.

Factors Impacting Perceptions and Misperceptions

There has been an extensive investigation throughout the literature that has sought to identify the range of factors that are most largely influencing the perceptions of the general public regarding criminal behavior, punitive attitudes, and level of trust towards measures being taken to treat violent offenders. The formulation of opinions is a process that is unique to every individual and has therefore resulted in an expansive range of beliefs, but several studies have been able to ascertain the most popular sentiments present. Some of the factors have been linked with blatant misconceptions about crime and criminal justice.

One factor that plays a significant role in forming people's stance on medical ethics related to criminal treatment is the fear of crime itself. Depending on the perceived threat that criminals pose to the public, the general sentiment may fluctuate as to what treatments are ethically acceptable. In 1976, researchers began to see a trend of increasing fear of crime as the result of a growing influence of television programs in the daily life of the American citizen (Gerbner & Gross, 1976). After surveying participants of varying levels of average daily exposure to television programming, the results of the study found that those with higher self-reported time spent viewing television shows were more likely to feel more at risk for experiencing encounters with violent individuals than

participants with less self-reported viewing periods. Additionally, that study further explained the implications of a growing sense of danger in the general public awareness. The study claimed that regardless of whether violent programs actually incite violence themselves or are just over-representing the average probability for encountering violence (or possibly both simultaneously), the result of an intensified fear of crime is an increased acquiescence to authority as well as an increased acceptance of the methods used by authority figures to implement criminal justice. In that case, the conditioning of the public to fear crime at an unnecessarily high degree may pacify the public to advancements in criminal justice methods that complicate existing lines of ethical boundaries, believing them to be warranted solutions. More recent studies have published similar findings that reflected a correlation between exposure to violent television content and heightened fear of crime. One study surveyed 3,712 Californians and sought to identify the strength of relationships between fear of crime and several sources of media. The results of the study found that television was more influential than other sources of media consumption for the purposes of elevating the perceived risk of routine violence and crime (Callanan, 2012). Another study from 2016 further supported the evidence relating exposure to television with attitudes toward crime. The study not only suggested that increased exposure to violent television content is related to increased fear of crime, but also that the resulting anxiety leads to the desire for tougher criminal justice policies (Roche, Pickett, & Gertz, 2016). This trend of media consumption must be accounted for, as the recent literature seems to be recognizing a significant relationship between reliance on media and an altered attitude toward crime and criminal justice.

An article published in 1992 sought to gauge the impact that media consumption has had over time on the general attitude of the public toward crime. The study found a serious lack of understanding on the part of the public regarding the true nature of the prevalence of crime and the true level of effectiveness of current criminal justice implementation methods (Roberts, 1992). Roberts argued that the research suggests that a widespread and accurate understanding of these factors would result in general satisfaction with the criminal justice system, but the recent reliance of the public on popular media outlets skews perceptions and leads to dissatisfaction. A study from 2015 did publish findings that suggested those who rely on news media for information regarding criminal justice and punishment are found to have less knowledge in those areas (Pickett, Mancini, Mears, & Gertz, 2015). On the other hand, the results also suggested that individuals with experience in the field of criminal justice were less likely to rely on the media to gain information on those topics. A study from 2016 utilized a web-based survey to gauge attitudes and knowledge about sex offenders in local communities and their rehabilitation. The results of that study suggested that those who were less educated on these areas tended to hold more negative perceptions of the nature of criminal justice for sex offenders and their rehabilitation (Höing, Petrina, Hare Duke, Völlm, & Vogelvang, 2016). Generally, these studies suggest another trend that affects the public attitudes toward the medical ethics of advancing treatments. As several studies have found a relationship between increased media consumption and increased fear of crime and more negative attitudes toward violent offenders, the misperceptions that come as a result of a reliance upon media outlets that fail to provide information that fully

encompasses the effectiveness of the criminal justice system is implying a general trajectory toward negative punitive attitudes.

Another clear example of increasingly negative punitive attitudes can be found in a study from 2014 that found a relation between support for capital punishment and exposure to television and talk radio (Britto & Noga-Styron, 2014). Frequent viewers of television programs specifically involving topics like crime and police drama were found to be linked with higher general support for capital punishment, while frequent viewers of news programs were also found to have higher levels of support for capital punishment but with the additional option of a life sentence without parole. Again, the result of increased exposure to media has been identified as a factor related to support for harsher treatment of criminal activity. However, a fifteen-year-old study found that it was not media consumption that predicted negative punitive attitudes, but a variety of demographic variables that make a significant difference in an individual's convictions concerning the appropriate measures of criminal justice (Dowler, 2003). The study speculated that covert discrimination within the criminal justice system may be largely affecting people's confidence in an effective system, as race happened to be identified as the clearest predictor of punitive attitudes. This suggests that a person's unique family history, exposure to culture biases, and other similar factors may all be influencing that individual's ethical standards related to criminal justice.

Nevertheless, there are general trends to be seen for those who hold strong punitive attitudes, regardless of demographic variables. A study from 2012 used a lottery choice task on 139 participants to mimic the responses those individuals would demonstrate when faced with discerning the relative importance of the severity of

punishment and probability of punishment. The study found that severity of punishment is the more influential variable on the deterrence of misbehavior (Friesen, 2012). The results of that study imply that people generally believe elevating the severity of punishment is effective in deterring criminal behavior, which may affect opinions on the acceptability of newly contrived treatment methods that push ethical boundaries. It is also important to point to studies such as Rosenberger and Callanan's from 2011, a study that surveyed over 4,200 Californians to gauge any kind of relationship that may exist between media consumption and punitive attitudes. This study specifically identified a relationship between increased consumption of news or crime-related shows and the prioritization of punishment over rehabilitation when considering treatment methods for criminals. These results are important to take into consideration, as it builds upon the identification of misperceptions of criminal justice as a result of exposure to media by also adding that the misperceptions further result in negative punitive attitudes. Individuals that believe violent crime is more rampant and believe the criminal justice system is not effective can only be expected to become more supportive of increasing the severity of security measures in contemporary society. (Rosenberger & Callanan, 2011)

Other possible factors may be leading to a distrust in current rehabilitation efforts. Mancini and Budd (2016) recognized one demographic factor that, when compared with other factors, was most significantly associated with low support for efforts being taken to treat sex offenders. This factor was identified as having children under the age of 17, and was speculated to be the result of a naturally protective parenting instinct that is more distrustful of the rehabilitation of a population that poses a threat to their children (Mancini & Budd, 2016). Those results suggest that uniquely personal factors such as

familial relationships can have a significant impact on one's perceptions of the current effectiveness of criminal treatment. Mancini (2014) identified factors such as income, residing in urban areas, and access to sex offender registries as impactful upon the public's concern regarding the rehabilitation of sex offenders. More specifically, these factors were linked to attitudes of doubtfulness that violent sex offenders can be rehabilitated to the same degree as offenders of less serious crimes. In 2010, 746 participants included in a study seeking to assess attitudes toward rehabilitation efforts revealed a significant tendency to believe in the impossibility of rehabilitating sex offenders (Payne, Tewksbury, & Mustaine, 2010). The research showed that there were no identifiable variables that impacted the attitudes of the participants. Instead, the authors of the study suggested that the general public is in need of education on sex offenders, the rehabilitation process, and the punitive features involved in the process of rehabilitation. Their implication was that the public's distrust of the system and disbelief in the value of rehabilitation of criminals is the result of a collective lack of education and awareness, and may be reversed with the proper strategies and policies.

The Need for Data on the Perspectives of Licensed Physicians

Past publications (Callanan, 2012; Dowler, 2003) have sought information on the factors that affect the opinions of different populations on the medical ethics of criminal treatment and the resulting sentiments that make their way into the mainstream. One area that is yet to be addressed in the literature deals with the personal convictions of the medical practitioners who administer treatments to patients on a daily basis. No study has been conducted that has brought to light the opinions of physicians themselves—whether any common themes or perspectives can be found among them that impact how they

practice medicine. The argument over the right to freedom of mind and of body involves two parties—the individuals being given treatments that may violate their personal freedoms and the individuals providing the treatments. Knowing this, it is a natural next step for the voices of medical practitioners to be heard so that the debate can be articulated more comprehensively, as it will finally be inclusive of all pertinent viewpoints. Such an investigation may reveal the factors that are most valued by licensed physicians when opting to participate in the implementation of specific treatment styles.

Method

Participants

Participants for this study were recruited through direct phone calls and emails to individuals who fit the relevant criteria. Personal contact information for potential participants was gained through publically available web pages. Those who were initially contacted with an offer to participate in this study must have had prior experience as a licensed physician working in a clinical setting. Potential participants were not offered compensation of any kind for their contribution to this study. One male participant agreed to participate in this study and submitted to an interview that was offered to be conducted over the phone or face-to-face. The participant had multiple graduate degrees in fields related to biomedical sciences. The participant also had over twenty years of experience in the field of implementing treatments to patients. The participant was employed by a large Christian university at the time of the interview. The participant opted to conduct the interview over the phone in March of 2018.

Several attempts were made to reach out to a variety of physicians from across the United States, most of which resulted in either no response or an inability to be

interviewed. The endeavor to seek out willing and able physicians was a difficult task for the author of this study, who entered into an unexpected obstructed territory regarding access to the contact information of potential participants. This phenomenon is a partial explanation for the limited amount of data collection utilized for the purposes of this study, which is important to note for future discussion.

Measures

This study was done with the intent of following a phenomenological model, which was described by Creswell (2007) as the utilization of the subjective experiences of individuals to reveal the unique features and themes of an identified phenomenon. The phenomenological nature of this study led to the utilization of self-report measures. The interview guide used for this study was adapted from that of a doctoral dissertation and was used to gather phenomenological data regarding the personal experience of university professors who could provide input on the integration of Christianity into academia (Sites, 2008). Questions were altered accordingly to fit the purposes of this study and its unique participant. In accordance with general self-report measures, answers were qualitatively analyzed for content and depth. The participant's answers to open-ended questions were analyzed for overarching themes. The trustworthiness of the interview guide can be found in its previous use to accurately assess the personal attitudes of university professors (Sites, 2008). However, several factors may interfere with the validity of this study. As with any self-report measure, answers may have been skewed as a result of a failure to self-evaluate on the part of the participant. Additionally, self-reported information may be purposefully altered for the purposes of appearing more or less in agreement with popular opinions. Other factors such as forgetfulness or

miscommunication between interviewer and participant must also be taken into consideration. However, efforts were taken during the interview to gain accurate insight and reduce any kind of miscommunication.

Procedures

Seven individuals with clinical experience from across the United States were contacted in the interest of recruitment, though the intention was to confirm participation of 2-5 individuals. The potential participants were recruited by personal contact through direct emails and phone calls. Individuals who were offered a participatory role in this study could voluntarily accept or decline to respect personal autonomy. The author of the study, who was also the conductor of the interviews, assured the confidentiality of identity and information gained through the interviewing process. All potential participants were offered the option to choose either an over-the-phone style interview or a face-to-face style interview, depending on geographical proximity to the interviewer as well as personal preference. The author of this study collaborated with the confirmed participant to conduct an interview and followed through with the set time and date previously agreed upon by both persons. The duration of the singular interview was slightly over half an hour. The interview was held over the phone, due to the significant geographical distance between the interviewer and the participant. At the beginning of the allotted interviewing period, the participant was briefed over the general structure of the interview and agreed to allow for an audio recording of the session. He then answered the subsequent interview questions in order of appearance on the interview guide. The questions covered topics such as details regarding personal characteristics, specifics about the career of the individual and the path taken to reach his current status, the typical

experiences of a normal day in his profession, the individual's personal opinions on the benefits and uncertainties of the utilization of neurointerventional treatments, the experiences that led to those opinions, the personal convictions of ethical boundaries when considering the use of neurointerventional treatments of criminals, and other related questions. The full interview guide can be found in Appendix A. Ultimately, the researcher formed the questions to gather a comprehensive understanding of the deep-rooted attitudes of the participant concerning the acceptability of contemporary methods of neurointerventional treatments on criminals. Appendix B contains the transcript of the participant's responses during the interview with identifiable information about the participant redacted.

Results

Patient-Centered Medical Practice

An essential step in the early portion of the interview was to have the participant lay out a foundation of his most basic beliefs about the purposes and parameters of medical practice. This understanding became the base from which all other opinions and experiences would stem from, making it a necessary addition to the data collection. The personal perspective of the participant centered around the themes of patient-centeredness, collaboration between patient and physician, and the use of practice to honor the Christian values.

Patient-centeredness and collaborative medical care were ideas that were emphasized and intertwined during the interview. From his experience, the job of the medical practitioner is to "figure out what the problem is and communicate an understanding of what's happening" to the patient and the patient's family. The physician

should have a competence to understand the presenting problems of his or her patients and the confidence that his or her commitment to help will lead to successful outcomes. This should be done, as the participant stressed, after clear communication with the patient. The chief goal of medical practice is to help the patient return to normal functioning in the way that best fits the patient's unique situation and wishes. In some instances, he noted that chemical restraint is used when patients become a danger to themselves or others and is usually done without their explicit consent. However, the participant stated that most decisions made throughout the stay of the patient are done collaboratively. He added some reflections on "this generation that seems to be very much more desirous of a collaborative model of health care", and how that has shaped his values in practice.

The personal religious faith of the participant was an influential factor throughout the course of the interview. He made sure to stress that medical practice "ultimately is all about God", and that he personally acts out of a Christian bioethical perspective. For him, this meant:

All people are created in the image of God and have intrinsic worth, and therefore deserve to be treated with dignity and respect for their personhood, irrespective of their behaviors that may fall short of what we think of as desirable or attractive.

(Appendix B)

These foundational beliefs would later be echoed in answers to questions covering medical ethics, but were also valuable in the attempt to verbalize the parameters and ultimate purpose of practice. Ultimately, the participant claimed to center his practice around the tenets of Christianity and the high regard placed upon the value of human

lives. In turn, this high regard has resulted in a practice that is, again, done in the interests of serving the patients to the highest degree of care.

Notable Ethical Dilemmas

Much of the content covered during the course of the interview either explicitly or implicitly revealed the ethical convictions of the participant. An overarching theme through the majority of the interview was that the ethical boundaries that seem to exist at the present time are reasonably respectful of the patient. Mainly, the answers of the participant reflected a general support for the allowances being made in the medical field after new advancements are made and treatments are suited to adapt to them. There was also a significant amount of time spent during the interview that dealt with the common contemporary ethical dilemmas that are faced by physicians.

The reasoning behind his supportive attitudes toward current ethical standards in the medical field mostly had to do with a belief in the helpfulness of physically and mentally invasive treatments in a broad sense. The participant reflected on his personal journey as a medical professional and how a persevering belief in a high regard for respecting human life and dignity led him to prioritize the well-being of the patient over preserving the natural state of the patient. As doctors are charged with the task of bringing about wellness through applying a storehouse of knowledge about the human body, they are primarily expected to display that knowledge through whatever capacity necessary to bring about that wellness. For a licensed physician, a fundamental part of the job is to provide patients with treatments that are usually reached through open communication between the physician and the patient. However, he noted that such

practices as chemical restraint or other neurologically manipulative treatments have caused frequent ethical dilemmas.

The ethical dilemma portrayed as most frequent and pressing throughout the participant's career was the use of chemical restraint on patients. Chemical restraint, or the use of medication to restrict or sedate a patient, was described during the interview as a "backup" solution for occasions when a patient becomes agitated or confused, sometimes to the point of becoming combative, and the safety of the patient and/or the hospital staff takes precedence. Chemical restraint was described as the backup to talk therapy, which is non-invasive but "certainly a disappointment" when it fails to calm the patient. In these instances, when patients lose the ability to "calm themselves or to listen effectively", physicians make a sort of "paternal intervention" that infringes upon consensual medical practice so that individuals involved are kept from danger. This type of treatment, in addition to any other mind or mood-altering drug, is inherently an ethical decision for the physician to make. The participant commented that his support for the use of mind-altering drugs was reluctantly positive, due to the general success of chemical restraint when talk therapy becomes ineffective.

Confidence in the Current System

Two recurring themes throughout the interview were an apparent trust in the contemporary consideration for medical ethics and the acknowledgment that the criminal justice system's utilization of mandated neurointerventional treatment is warranted. The participant, when asked to explain his experience with and knowledge of neurointerventional therapy methods, generally spoke in a manner that supported the ways in which neurointerventional treatment styles are currently being utilized. It was

personally estimated by the participant that over half of violent criminal cases are the result of “abnormal organic issues that can be remediated with the appropriate use of medication”. The participant referenced anecdotes dealing with topics such as anti-seizure medication and genetic modification when asked to consider modern treatments of conditions demonstrating an attempt to control social or cerebral nonconformities. Much of the past experience the participant had that dealt with neurointerventional therapy had to do with treating seizure disorders, many cases presenting themselves as the result of meningitis or encephalitis. His personal experience with rehabilitation methods that utilized manipulation of an individual’s central nervous system seemed to be primarily positive, along with appropriate caveats. Most notably, the participant referred to the frequent use of electroencephalography during his career that was largely beneficial in treating brain abnormalities that led to seizures in patients. The electroencephalogram (EEG) test would be analyzed to identify the focus, or originating site, of the seizure, and an anesthetic called propofol would be used for the purposes of performing an ablation procedure to stop the seizures. Ultimately, both the use of the EEG and the drug propofol led to the effective and efficient treatment of seizure disorders, though they involved direct manipulation of the central nervous system. Those positive experiences in addition to years of knowledge regarding scientific advances led to the participant’s notable support for the current state of the medical community’s ethical standards and their practical function in modern medicine.

It should be noted that there were instances when the participant recalled negative examples of the uses of neurointerventional technology. In reference again to patients dealing with seizure disorders, the participant spoke of “all sorts of failures” he had

witnessed during his time in the field when anti-seizure treatments and medications caused added difficulties and medical complexities for the patient. There were a number of past cases when anti-seizure medication and sedation led to the failure to stop the seizures, “prolonged or protracted” seizures, respiratory depression, and other adverse effects. When patients do not respond to anti-seizure medication, physicians are at a loss for a viable solution to stop the actively seizing patient from becoming further impaired. When patients exhibit adverse responses to the given treatment, serious health risks such as depressed breathing and a lack of oxygen delivery to tissue may be inadvertently imposed upon the patient. This two-pronged concern for neurointerventional treatments, seeing the potential for medical failures through non-responsiveness to treatments as well as unexpected adverse effects as the result of treatments, is generalizable to a variety of neurointerventions. The unintended failure of the administration of neurologically based treatments is a potential problem for most, if not all, cases involving the attempted manipulation of an individual’s natural state. Before touching on the subject of the ethics of such practices, the participant commented on his considerable concern for the potential failures of such treatments.

Concern for the Future

The participant discussed a healthy concern for future trends in scientific advancements and their practical use in standard medicine. He had noted an interest in monitoring the course of certain scientific advancements and their consequent impact on the field of neurology and related fields of medicine. Specific examples of areas causing concern were brought up in conversation, such as the increased use of medication for treatment and the current developments in genetic modification in embryologic selection.

These trends were described by the participant as “conceivably diminishing one’s uniqueness as a person”, as well as being facilitators of conversations dealing with the value of human life. He described genetic modification during the embryonic stage as the “selection of certain characteristics and the elimination of other characteristics”, whereas the selected characteristics are “deemed more desirable” and the eliminated characteristics may belong to other individuals whom society may begin to view as lesser. It was discussed that if society moves toward utilitarianism or pragmatism in the attempt to cure all nonconformities, it may undermine previously upheld bioethical standards. This kind of unique innovation seems to be a source of concern in the minds of some doctors.

Discussion

Implications

The major findings of this phenomenological study are that while ethical issues are concerns that doctors do consciously weigh, the current trends in scientific advancements regarding neurointerventional treatments are not yet significantly threatening to reasonable ethical standards. The continuous evaluation of the widespread impact that cutting-edge innovations in neurotherapy have throughout the globe is a necessary practice, in order to avoid neglectful or unconcerned medical practices. However, the implications of the data gathered for the purposes of this study suggest that this practice is understood throughout the medical community. For cases involving criminal punishment or rehabilitation, the data suggest that practitioners similarly do not see ethical boundaries being violated. In the effort to return offenders to a level of functioning that is beneficial to society, rather than harmful, neurointerventions are seen

as justifiable acts of sentencing that usually match the severity of the crimes committed. This matches the literature that purports the sufficient justification behind using neuro-correctives when they promise a greater probability for positive change (Pugh & Douglas, 2016). However, with a growing scientific understanding of how to manipulate the human body to exhibit more socially acceptable behaviors, it is vital that practitioners be wary of the consequences of their chosen treatments.

For the average case of criminal sentencing, a court-ordered method of treatment is believed to be ethically viable by those who carry out treatments for other individuals with impaired functioning. Though the continuous developments in science and medicine allow treatments to become increasingly invasive of the human body and mind, treatments are perceived by an experienced professional to be appropriate responses to the crime. Additionally, rehabilitative treatments are seen as not only appropriate, but helpful to increase the autonomy and healthy behaviors of patients, an idea that is reflected in the literature (Bomann-Larsen, 2013). However, this belief is warranted with a caveat. In addition to the belief that criminal sentencing is generally helpful and justified, there are reported cases in which ethical issues are raised due to the significantly altered state of the individual. Personality changes and lifestyle changes may be a result of certain methods of neurologically invasive therapy techniques, which necessitates scientific accountability on the severity of such a phenomenon. Ultimately, the primary concerns of physicians include gauging the balance between the restoration of normal functioning to the individual and implementing potentially ethically ambiguous treatments.

Limitations

This study had multiple limitations, the most notable being that the insight gathered during the interview represented the views of a singular individual. The purpose of the study was to gain phenomenological data, which was intended to be done through a small number of participants. For the purpose of developing a deeply comprehensive understanding of the perceptions of the participants, the number of participants was intentionally limited. However, this was done at the cost of producing results that may or may not be generalizable to the entire medical community. It is suggested that this study should be replicated at some point in the future but carried out with procedures and measures that gain the collective insight of a significantly larger number of doctors.

Another apparent limitation of this study was the self-report style of measurement. This study design was chosen for its value in discovering relevant themes and nuances that form a comprehensive nature of a specific phenomenon. However, data gathered through self-report can potentially be skewed in ways that are difficult to control. Though there was no reason to suspect an intentional modification of the stated beliefs of the participant, total assurance of the claims made by the participant is impossible. Additionally, it is possible that the personal biases of the interviewer had an impact on the interpretation of the data gathered. Future studies may introduce a design that can account for and reduce the subjective nature of the collecting of data.

Conclusion

When considering the impact of recent developments of neurointerventional methods being implemented by medical practitioners in the field, it is necessary to reflect on the ramifications of those methods upon modern bioethical standards. The use of such

methods that are invasive to an individual's freedom of mind, obviously exemplified within the criminal justice system, must be consistently kept in check by those who possess expert knowledge in those fields. The practical wisdom, and expertise of medical professionals can be valuable tools to evaluate both the positive and negative contributions of certain advancements in medicine. Operating out a Christian bioethical worldview seems to result in the belief that current treatment methods that have done a great service in curbing the effects of neurological disorders. However, an existing concern is the consideration of the consequences of a society that places greater value on certain desirable characteristics and systematically eliminates less desirable ones through mandated or nonconsensual treatments.

With the progression of time, humanity will see continued developments in the relationship between the criminal justice system and neurointerventional technology. Each subsequent development in that delicate relationship is subject to an ethical analysis. To prevent malpractice and to discourage modern medicine from favoring some model of an ideal human, it is necessary for licensed physicians and other experts in medical practice to be wary of progress in this area. For now, society may rest in the confidence physicians seem to have in the current system's accountability to balance justice and human dignity.

References

- Artal, R., & Rubenfeld, S. (2017). Ethical issues in research. *Best Practice & Research Clinical Obstetrics & Gynaecology*.
- Bechara, A., & Van Der Linden, M. (2005). Decision-making and impulse control after frontal lobe injuries. *Current Opinion in Neurology*, 18(6), 734-739.
- Berryessa, C. M., Chandler, J. A., & Reiner, P. (2016). Public attitudes toward legally coerced biological treatments of criminals. *Journal of Law and the Biosciences*, 3(3), 447-467.
- Bomann-Larsen, L. (2013). Voluntary rehabilitation? On neurotechnological behavioural treatment, valid consent and (in) appropriate offers. *Neuroethics*, 6(1), 65-77.
- Britto, S., & Noga-Styron, K. E. (2014). Media consumption and support for capital punishment. *Criminal Justice Review*, 39(1), 81-100.
- Bublitz, C. (2016). Moral enhancement and mental freedom. *Journal of Applied Philosophy*, 33(1), 88-106.
- Bublitz, J. C. (2014). Freedom of thought in the age of neuroscience. *Archiv für Rechts- und Sozialphilosophie*, 100(1), 1-25.
- Bublitz, J. C., & Merkel, R. (2009). Autonomy and authenticity of enhanced personality traits. *Bioethics*, 23(6), 360-374.
- Callanan, V. J. (2012). Media consumption, perceptions of crime risk and fear of crime: Examining race/ethnic differences. *Sociological Perspectives*, 55(1), 93-115.
- Carlsmith, K. M. (2006). The roles of retribution and utility in determining punishment. *Journal of Experimental Social Psychology*, 42(4), 437-451.

- Cherek, D. R., Lane, S. D., Pietras, C. J., & Steinberg, J. L. (2001). Effects of chronic paroxetine administration on measures of aggressive and impulsive responses of adult males with a history of conduct disorder. *Psychopharmacology*, 159(3), 266-274.
- Christensen, J. F., & Gomila, A. (2012). Moral dilemmas in cognitive neuroscience of moral decision-making: A principled review. *Neuroscience & Biobehavioral Reviews*, 36(4), 1249-1264.
- Coccaro, E. F., Lee, R. J., & Kavoussi, R. J. (2009). A double-blind, randomized, placebo-controlled trial of fluoxetine in patients with intermittent explosive disorder. *The Journal of Clinical Psychiatry*, 70(5), 653-662.
- Cools, R., Blackwell, A., Clark, L., Menzies, L., Cox, S., & Robbins, T. W. (2005). Tryptophan depletion disrupts the motivational guidance of goal-directed behavior as a function of trait impulsivity. *Neuropsychopharmacology*, 30(7), 1362.
- Craig, J. N. (2016). Incarceration, direct brain intervention, and the right to mental integrity—A reply to Thomas Douglas. *Neuroethics*, 9(2), 107-118.
- Creswell, J. W. (2007) *Qualitative inquiry & research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.
- Crockett, M. J. (2009). The neurochemistry of fairness. *Annals of the New York Academy of Sciences*, 1167(1), 76-86.
- Crockett, M. J., Clark, L., Hauser, M. D., & Robbins, T. W. (2010). Serotonin selectively influences moral judgment and behavior through effects on harm aversion. *Proceedings of the National Academy of Sciences*, 107(40), 17433-17438.

- Dawson, A. J. (2015). Ebola: What it tells us about medical ethics. *Journal of Medical Ethics*, 41(1), 107-110.
- deCharms, R. (2007). Reading and controlling human brain activation using real-time functional magnetic resonance imaging. *Trends in Cognitive Sciences*, 11(11), 473-481.
- de Zulueta, P. C. (2015). Suffering, compassion and “doing good medical ethics”. *Journal of Medical Ethics*, 41(1), 87-90.
- DeKeyser Ganz, F., & Berkovitz, K. (2012). Surgical nurses’ perceptions of ethical dilemmas, moral distress and quality of care. *Journal of Advanced Nursing*, 68(7), 1516-1525.
- Douglas, H. (2014). The moral terrain of science. *Erkenntnis*, 79(5), 961-979.
- Douglas, T. (2010). Intertemporal disagreement and empirical slippery slope arguments. *Utilitas*, 22(2), 184-197.
- Douglas, T. (2014). Criminal rehabilitation through medical intervention: Moral liability and the right to bodily integrity. *The Journal of Ethics*, 18(2), 101-122.
- Dowler, K. (2003). Media consumption and public attitudes toward crime and justice: The relationship between fear of crime, punitive attitudes, and perceived police effectiveness. *Journal of Criminal Justice and Popular Culture*, 10(2), 109-126.
- Epperson, M. W., Wolff, N., Morgan, R. D., Fisher, W. H., Frueh, B. C., & Huening, J. (2014). Envisioning the next generation of behavioral health and criminal justice interventions. *International Journal of Law and Psychiatry*, 37(5), 427-438.
- Focquaert, F. (2014). Mandatory neurotechnological treatment: Ethical issues. *Theoretical Medicine and Bioethics*, 35(1), 59-72.

- Fortune, C. A., Ward, T., & Willis, G. M. (2011). The rehabilitation of offenders: Reducing risk and promoting better lives. *Psychiatry, Psychology and Law*, 19(5), 646-661.
- Friesen, L. (2012). Certainty of punishment versus severity of punishment: An experimental investigation. *Southern Economic Journal*, 79(2), 399-421.
- Gerbner, G., & Gross, L. (1976). Living with television: The violence profile. *Journal of Communication*, 26(2), 172-199.
- Gilbert, F. (2012). The burden of normality: From “chronically ill” to “symptom free”. New ethical challenges for deep brain stimulation postoperative treatment. *Journal of Medical Ethics*, 38(7), 408-412.
- Glenn, A. L., & Raine, A. (2014). Neurocriminology: Implications for the punishment, prediction and prevention of criminal behaviour. *Nature Reviews. Neuroscience*, 15(1), 54.
- Glerup, C., & Horst, M. (2014). Mapping “social responsibility” in science. *Journal of Responsible Innovation*, 1(1), 31-50.
- Greely, H. T. (2012). Direct brain interventions to “treat” disfavored human behaviors: Ethical and social issues. *Clinical Pharmacology & Therapeutics*, 91(2), 163-165.
- Grunwald, A. (2012). *Responsible nanobiotechnology: Philosophy and ethics*. Boca Raton, FL: CRC.
- Höing, M. A., Petrina, R., Hare Duke, L., Völlm, B., & Vogelvang, B. (2016). Community support for sex offender rehabilitation in Europe. *European Journal of Criminology*, 13(4), 491-516.

- Kazatchkine, M., Kinderlerer, J., & Gilligan, A. (2017). Brussels Declaration: Twenty-Point plan for science policy. *Nature*, 541(7637), 289-289.
- Knoll, J. L. (2015). The psychiatrist's duty to protect. *CNS spectrums*, 20(3), 215-222.
- Knoppers, B. M. (2014). Framework for responsible sharing of genomic and health-related data. *The HUGO Journal*, 8(1), 3.
- Koenigs, M., Young, L., Adolphs, R., Tranel, D., Cushman, F., Hauser, M., & Damasio, A. (2007). Damage to the prefrontal cortex increases utilitarian moral judgements. *Nature*, 446(7138), 908.
- Kuritzkes, D. R. (2016). Why cure, why now? *Journal of Medical Ethics*, medethics-2015.
- Mancini, C. (2014). Examining factors that predict public concern about the collateral consequences of sex crime policy. *Criminal Justice Policy Review*, 25(4), 450-475.
- Mancini, C., & Budd, K. M. (2016). Is the public convinced that "nothing works?" Predictors of treatment support for sex offenders among Americans. *Crime & Delinquency*, 62(6), 777-799.
- Payne, B. K., Tewksbury, R., & Mustaine, E. E. (2010). Attitudes about rehabilitating sex offenders: Demographic, victimization, and community-level influences. *Journal of Criminal Justice*, 38(4), 580-588.
- Petersen, T. S., & Kragh, K. (2016). Should violent offenders be forced to undergo neurotechnological treatment? A critical discussion of the "freedom of thought" objection. *Journal of Medical Ethics*, medethics-2016.

- Pickett, J. T., Mancini, C., Mears, D. P., & Gertz, M. (2015). Public (mis) understanding of crime policy: The effects of criminal justice experience and media reliance. *Criminal Justice Policy Review*, 26(5), 500-522.
- Pugh, J., & Douglas, T. (2016). Justifications for non-consensual medical intervention: From infectious disease control to criminal rehabilitation. *Criminal Justice Ethics*, 35(3), 205-229.
- Pugh, J., & Maslen, H. (2015). 'Drugs that make you feel bad'? Remorse-based mitigation and neurointerventions. *Criminal Law and Philosophy*, 1-24.
- Raine, A. (2013). *The anatomy of violence: The biological roots of crime*. New York, NY: Pantheon House.
- Roberts, J. V. (1992). Public opinion, crime, and criminal justice. *Crime and Justice*, 16, 99-180.
- Roche, S. P., Pickett, J. T., & Gertz, M. (2016). The scary world of online news? Internet news exposure and public attitudes toward crime and justice. *Journal of Quantitative Criminology*, 32(2), 215-236.
- Rosenberger, J. S., & Callanan, V. J. (2011). The influence of media on penal attitudes. *Criminal Justice Review*, 36(4), 435-455.
- Ryberg, J. (2012). Punishment, pharmacological treatment, and early release. *International Journal of Applied Philosophy*, 26(2), 231-244.
- Shapiro, Z. E. (2017). Bioethics in the law. *Hastings Center Report*, 47, inside front cover. doi:10.1002/hast.662

- Shniderman, A. B., & Solberg, L. B. (2015). Cosmetic psychopharmacology for prisoners: Reducing crime and recidivism through cognitive intervention. *Neuroethics*, 8(3), 315-326.
- Shrader-Frechette, K. (2012). *Science policy, ethics, and economic methodology: Some problems of technology assessment and environmental-impact analysis*. Dordrecht, Holland: D. Reidel.
- Sinnott-Armstrong, W. (2014). *Moral psychology: Free will and moral responsibility*. MIT.
- Sites, E. C. (2008) *Separate threads or a single woven piece? a phenomenology of the integration of faith and learning* (Doctoral dissertation). Retrieved from Liberty University Digital Commons. (100)
- Stahl, S. M. (2015). Is impulsive violence an addiction? The habit hypothesis. *CNS spectrums*, 20(3), 165-169.
- Stinneford, J. F. (2005). Incapacitation through maiming: Chemical castration, the Eighth Amendment, and the denial of human dignity. *U. St. Thomas LJ*, 3, 559–599.
- Surmeli, T., & Ertem, A. (2009). QEEG guided neurofeedback therapy in personality disorders: 13 case studies. *Clinical EEG and Neuroscience*, 40(1), 5-10.
- Tobia, K. P. (2016). Personal identity, direction of change, and neuroethics. *Neuroethics*, 9(1), 37-43.
- Uusitalo, S., & van der Eijk, Y. (2015). Scientific and conceptual flaws of coercive treatment models in addiction. *Journal of Medical Ethics*, medethics-2015.

Valenti, E., Giacco, D., Katasakou, C., & Priebe, S. (2013). Which values are important for patients during involuntary treatment? A qualitative study with psychiatric inpatients. *Journal of Medical Ethics*, medethics-2011.

Vincent, N. A. (2014). Restoring responsibility: Promoting justice, therapy and reform through direct brain interventions. *Criminal Law and Philosophy*, 8(1), 21-42.

Young, L., Camprodon, J. A., Hauser, M., Pascual-Leone, A., & Saxe, R. (2010). Disruption of the right temporoparietal junction with transcranial magnetic stimulation reduces the role of beliefs in moral judgments. *Proceedings of the National Academy of Sciences*, 107(15), 6753-6758.

Zhao, H. K., Chang, C. W., Geng, N., Gao, L., Wang, J., Wang, X., ... & Gao, G. D. (2012). Associations between personality changes and nucleus accumbens ablation in opioid addicts. *Acta Pharmacologica Sinica*, 33(5), 588.

Appendix A

Interview Guide for Medical Professionals

1. Tell me about yourself; your job/work, what you do? (NOTE: not just a “job description” but thicker, richer)
 - a. Prompts:
 - i. What brought you to this career?
 - ii. Describe a typical day.
2. Tell me about your life/a typical day outside of your work.
 - a. Prompts:
 - i. Family/Friends
 - ii. Recreation, hobbies, outside interests
 - iii. Free time
3. Describe for me your understanding of medical practice and the journey or process that brought you to this understanding. (NOTE: This question is asked here only if it has not been addressed as a result of question 1 or 2).
4. What are the benefits of using neurological treatments?
 - a. Prompts:
 - i. Thoughts, ideas, concepts, experiences that come to mind
5. As you think of your experience, describe the most effective or best instance of neurointerventional therapy you have **witnessed**?
6. Describe the most effective or the best instance of neurointerventional therapy you have **participated in**?

7. Have there been any instances of failures in neurointerventional therapy that you have witnessed?
 - a. Prompts:
 - i. Describe that instance.
 - ii. Help me understand...
8. Have you ever been concerned by the use of neurointerventional therapy with an individual client or a group? Tell me about that.
9. What severity of criminal cases do you believe necessitates a mandated alteration of someone's body chemistry as a treatment for criminal behavior?
10. Have you experienced any personal ethical dilemmas in your time in practice, or during your training?
11. Do you believe that altering someone's natural state is an effective component of therapy or rehabilitation? In what ways?
12. What else, significant to your training or experiences, would you like to share?
13. What are your views of the general contemporary trends of medical ethics being practically implemented?
14. If you had carte blanche and could change anything you wanted about the training/education of practitioners or about your clinical work in the field – what would you like to see changed?

Appendix B

Participant's Responses Corresponding to Interview Guide

1. I am an associate professor at (School A). My department is pediatrics. I graduated from (School B) in 1986, and did a pediatric residency at (Hospital A) in 1990. I then ultimately went on to a pediatric emergency medicine fellowship at (School C), which is a consortium in the (redacted) area and did a fellowship based out of (Hospital B) which was completed in '93. I accepted my first position at (School D) in '93 and was there until '98 and actually started into a fellowship in my specialty and have had a few positions subsequent to that point. Then I accepted a position here at (School A) about 19-20 months ago.

I have been an exercise physiologist and worked where in what's considered a para-health field and helped for wellness and nutrition, and essentially had taken an awful lot of science. I had really loved physiology and anatomy and did well academically. So although I was a bit of a late bloomer I decided to apply to medical school during my graduate program and was accepted. So I think it was just, for someone who wasn't on medical school fast-track prior to grad school - I enjoyed science, I enjoyed learning about the human body, I wanted to do more, I had reasonable success, I'd taken classes with some medical students and found that I was competitive. The pre-med idea became demystified, to some extent, and so I decided to go back and took all of the science pre-req's for a pre-med student, applied and was accepted.
2. I am an avid reader. I have been to seminary. I have about 20 semester units from (School E), so that's been kind of a hobby, as I wanted to get to know God better.

In addition to being an avid reader of worldview and spiritual formation and systematic theology, I also enjoy reading about politics and, I suppose, public policy or health policy. As you might expect for a former exercise physiologist, I enjoy working out and physical fitness.

3. Medical practice is really all about the patient and ultimately it's all about God. So people bring their children in because they want everything to be OK, they want their child to be safe, they want to know everything will be OK, and they want their child to not suffer. So it's actually pretty simple. So my job is to try to figure out what the problem is and communicate an understanding of what's happening and work with the parent and the child sometimes. Sometimes to intellectually understand what needs to be done and have sufficient confidence in my understanding and my commitment, and that they will have faith in doing what I say and discharge from the hospital when the plan is medicine from home. So it needs to be very patient-centered and collaborative, and communication is very important, especially in this generation that seems to be very much more desirous of collaborative model of health care.
4. My experience with neurologic therapy is certainly very important. I've dealt with an awful lot of people with seizures. In an emergency position, I've dealt with seizure disorders and have given a lot of anti-seizure medication. I've had an awful lot of experience in this area and a lot of people at risk for meningitis. A lot of children with fever and short seizures. So between babies with fever [and others], I've spent a lot of time trying to detect or prevent meningitis or encephalitis.

5. It's a little bit off the beaten path. When I was in my first few years of being in faculty at (Hospital C), I think one of the things I've really found extremely inspiring was the use of propofol, the medication Michael Jackson was unfortunately being treated with. We would have patients who would be hospitalized for the purpose of trying to understand and determine precisely where their seizures were beginning in their brain. So they were hooked up to a continuous EEG and there was concern over whether or not one spot was going to be a continuing source of seizures. So these children would be hospitalized following a seizure and then immediately there would be pursuit with continuing EEG test as an identifier of where the seizure focus was located. This was done to plan for what's called an ablation procedure where this particular area, the source of ongoing seizures, could be rectified electrically. I spent an awful lot of time in a hospital service where we would drop everything, run over to the patient who had the seizure and give them propofol immediately, stop the seizure, and there'd be an opportunity to identify the originating site. That was probably by far the most dramatic experience I had, was running to a patient who was having seizures and then I'd be able to show they had immediately had taken the patient to a safer situation. That was very helpful.
6. N/A
7. Oh my goodness yes. All sorts of failures. With pediatric seizures in general, there are a lot of children who receive the various medications and their seizures just don't respond. I've seen a number of children and adolescents with seizures who continued to have seizures and that had seizures for a duration that is quite

dangerous. I've seen people that don't respond to anti-seizure meds and have quite a bit of difficulty with prolonged or protracted seizures.

8. Oh yes absolutely. Sometimes the medication can become so sedating that the patients breathing is depressed, so not only do you have persistent seizures but you also have the seizure medication is causing respiratory depression. So you have 2 adverse effects almost simultaneously that are additive. You have seizures continuing because the medication isn't suppressing the seizures, so you have that causing increased parabolic expenditure and then you have a reduced breathing and that will cause a lack of oxygen delivery to the tissues and that can be dangerous. So you have 2 significant problems that occur. So yes, I've had lots of problems with neurologic treatments.
9. Over 50%. I do think that there is an awful lot of abnormal organic, if you will, chemical issues that can be remediated with the appropriate use of medication for those with criminal backgrounds.
10. I think whenever someone gives a patient a mind or mood altering drug to control their behavior, one is making an ethical decision. Their behavior can't be, and this is in an emergency situation, can't be addressed safely or expeditiously to talk therapy and therefore for management purposes, which means their safety as well as the staff's safety. The need for medication is a backup, if you will. Ideally the lack of success in talk therapy is certainly a disappointment. At some point, the safety of the patient and staff will need to take precedence. That is probably my most frequent ethical dilemma, is when to use, and it's called chemical restraint, to calm down a combative or uncooperative patient. That's a frequent ethical

decision I've made. And the reason why it's ethical is because drug administration can have adverse effects, including respiratory depression. It's also usually done without expressed consent on the part of the patient. It's a very paternal intervention on the part of the physician who's ordering these drugs on behalf of the patient and the staff.

11. Reluctantly, I think it can be. At times, patients can become so incredibly agitated, confused, etc., that talk therapy is not going to be successful. The ability to calm themselves, to listen effectively, and to understand what they need to do so they sometimes need chemical modification, in order for subsequent therapy to be effective.

12. N/A

13. I am working on a biomedical graduate degree at this time. A Christian bioethical perspective suggests that all people are created in the image of God and have intrinsic worth, and therefore deserve to be treated with dignity and respect for their personhood, irrespective of their behaviors that may fall short of what we think of as desirable or attractive. So it's kind of an unconditional regard for humans because of their special relationship to God. I think this concern over increasing medication, and therefore conceivably diminishing one's uniqueness as a person, should always be a consideration. Also, as you intimated, the lack of boundaries regarding genetic manipulation so far as the selection of embryologic selection of certain characteristics and the elimination of other characteristics is certainly discussed and absolutely causes us to diminish the value of human life, if we start to place greater value on those whose characteristics are deemed more

desirable. So if we can say “I can create something that’s better and less problematic, and eliminate illness, do I therefore place higher value on beings who are less flawed, if you will”. And I think that is an uncomfortable idea to contemplate going forward, with our increasing ability to select out undesirable genetic characteristics. So I think we’re on the edge of this at this point, but this is something we’ll have to be very careful about as we go forward. And I think in a utilitarian society that is progressing toward pragmatism, maybe it will work against us and we will think less of those who have characteristics that we increasingly deem as undesirable.

14. The current state of electronic clinical records is such that it is much more oriented toward comprehensiveness intended to enhance protection of both physicians and institutions against medical/legal repercussions. Unfortunately, because the EMR is so generally burdensome, the result is that physicians are taken away from the patient and are replacing [them with] a computer, instead of interacting with a patient, in an attempt to document the interactions, and thinking that they should be spending their time on those. A lot of physicians, including myself, believe that we’ve gone too far in the attempt to achieve perfect documentation and we’ve created an efficient, computer-centered practice as opposed to spending more time face to face with the patients. So EMRs are probably going to improve in some respects, but the basic premise, which is to perfectly document every private interaction, is somewhat backwards, in that it actually detracts from the interaction that it’s supposed to document. So it’s almost a self-defeating process if you want to create a quality of care, greater

patient-centeredness of care, and you want it to be accomplished in a reasonable amount of time, then something has got to give. So that's the problem I think most clinicians have - is how much is too much as far as documenting, and how little is too little in regard to the time allowed for the direct interaction with the patient. There are ways in which people have attempted to do this. One way is to have others, essentially scribes, serve to follow patients and physicians through their stay and document what's happened during their stay and keep a record of it, almost like a biography or narrative of the entire medical visit. Certainly, that adds complexity and expense to the patient encounter. That seems to be one way in which this is being addressed. It still seems, for a variety of reasons, that physician-patient face time has been sabotaged as a result of our need for virtually perfect documentation of encounters. So this is a problem, and EMRs right now are generally unpopular because they seem to detract from the extensive demand for the face time.