

University of Nevada, Reno

**How Institutional Officials Perceive the Safety, Legal, and Ethical
Liabilities Regarding the Use of the Newly Dead
for Clinical Training and Forensic Research**

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctorate of Philosophy in
Educational Leadership

by

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May, 2012

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Abstract

A descriptive multiple case study was conducted to determine strategies, programs, and procedures that higher education institutional administrations implement to understand and mitigate liability in regard to legal, ethical and safety issues in the use of the newly dead for clinical training and forensic research. This case study method used cross-case analysis which allowed an exploratory, descriptive, and knowledge-gathering approach in the realm of using unembalmed cadavers for these purposes. Using semi-structured interviews, direct observation, and document analysis, the data was analyzed for emergent themes to identify common elements of established programs. Findings will contribute to our understanding on implementation of these programs; will increase the literature base by analyzing, in conjunction, both ethical and safety issues; and will explore maintaining the donor autonomy with balancing the donor's wishes with the societal good of increased medical knowledge and/or skill.

Dedication

I dedicate this dissertation to my dad, Vet R. Woolf, Sr. My father died of complications of lung cancer during the research phase of my dissertation. My dad, a scientist, himself, engaged in many candid conversations about this topic and was highly interested in the outcome of this study. Watching his medical treatment, as the doctors practiced medicine to find an effective chemotherapy; I realized society needs the best trained medical professionals available. Cadavers are necessary to achieve this goal. To balance this, my father's death also taught me that it is possible to have an emotional tie to a body. With his death, I could not look at his body as a shell, as I had originally thought of cadavers. His body was a much loved and revered man – the physical manifestation of my father. As such, all of the ethical literature became relevant to me. Immediately I understood how ethical issues arise from whole-body donation and the research conducted on cadavers. Thank you Dad, you continue to teach me even after you have gone.

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CHAPTER I

INTRODUCTION

The use of the newly dead for clinical training and forensic research is an inherently sensitive issue. This sensitivity is historical as well. Emily Dickinson wrote, “It was not death for I stood up, and all the Dead, lie down” (Dickinson, 1891/2010, Kindle Location 1009). Dickinson wrote this poem not only to try and explain death, but to also describe why she was not dead, perhaps an indication of an innate fear of death or the finality of death. Culturally, as a society that does not tend to engage in discussions of death, the use of cadavers for clinical training and anthropological research is inherently controversial. Giordano (2005) posited that because death is not discussed within western culture, issues surrounding death become sensitive to the living human.

Although controversial, there are great benefits to using unembalmed cadavers for clinical training and forensic research purposes. Clinical training with unembalmed bodies allows medical professionals to practice on tissue that is the most similar to live human tissue. Medical procedures, such as intubations and venous cut-downs, can be practiced on an unembalmed cadaver to increase medical knowledge and skill competency. The tactile feel of the body is needed for these procedures, so unembalmed bodies, instead of embalmed cadavers, are needed for this purpose.

Forensic anthropological research allows estimation of decomposition rates of humans in various configurations. The research is important to develop the science on how to identify the decomposition state, estimate time of death, and identify the way the person died. Both practices are vitally important to the healthcare field as well as to

public safety and military operations; unembalmed bodies or the newly dead are frequently used for these purposes.

There are many ways of learning about the anatomy of a human body. Medical schools and undergraduate anatomy classes traditionally use embalmed cadavers for gross anatomy or anatomy and physiology classes. Some medical schools use computational simulation models for anatomical learning purposes to either enhance the learning experiences along with embalmed cadavers or to substitute for embalmed cadavers entirely. Substitution usually occurs because the institution does not have the proper laboratory ventilation for the formaldehyde typically used for embalming cadavers. However, it is not clearly understood if computational simulation models are the best pedagogy for anatomical teaching purposes. As such, many medical training programs continue to rely upon the use of cadavers.

In the realm of clinical training and research on the newly dead, there are also numerous ethical issues that evolve from the nebulous definition of a human being. In order to evaluate the ethical issues, an exploration of the current practices in the use of unembalmed bodies for clinical training/research on the newly dead is warranted. Issues such as whether the body is property after death, if the dead can be harmed, the societal good of using cadavers for clinical training, autonomy, and family well-being are all considerations in relation to presumed and informed consent in the processes associated with body donation for the purpose of science.

Ethical, legal, and safety issues constitute three of the main challenges of using unembalmed cadavers for medical clinical training and medical and forensic research. Many studies have been conducted on the ethics, legal, and safety issues of using the

dead for research and training, but on the other hand, not many studies have been conducted analyzing these issues, and they have tended to be explored in isolation of each other. There is a gap in the literature relating how these three concepts (i.e., ethics, legal, and safety) intersect and how institutional officials perceive and mitigate liability in regard to these concepts. This study was conducted in order to research and analyze these issues and serves as a source of information for any institution considering implementing programs using the newly dead in clinical training or for forensic anthropological research.

Background of the Study

As the newly dead are needed for clinical training and forensic anthropological research, certain responsibilities must be in place to protect the anonymity of the body and to ensure that the proper permissions were obtained to use donated bodies. Use of donated bodies must be conducted in an ethical and legal manner in order to protect the donor, the donor's family, and also the recipient (e.g., the institution). In addition, worker protection laws require the employer to notify employees of job risks, as well as mitigate these potential risks as much as possible. Public relations need to be utilized to educate the public on the benefits of cadaver use in order to acquire body donations and also to assist in the overall public's perception of the institution.

How do institutional officers implement programs to assure ethical, safety, and legal considerations are addressed when using the newly dead for clinical training and forensic research purposes? What type of programs, procedures, and strategies must be considered to ensure donor autonomy balanced with the gain of medical knowledge

and/or skill? How is the balance between ethics, safety, and legal issues and the gain of medical knowledge and competency achieved?

Use of Embalmed Cadavers

In a discussion on the dangers of formaldehyde exposure and the use of computer simulation for anatomy classes, university anatomist, Dr. Carl Sievert, stated that anatomy class is not only for teaching medical students structural placement knowledge of anatomy structures, but is mainly used to teach the medical students the variability among humans (C. Sievert, personal communication, February 17, 2011). According to Dr. Sievert, this knowledge is not relayed during computer simulation anatomy, as only a few bodies have been converted to digital format. At the same time, many institutions have stopped using full cadavers for reasons of exposure to formaldehyde and the anatomical laboratories with the adequate ventilation are expensive to build; however most medical schools still use embalmed cadavers for gross anatomy.

Using the Newly Dead

Medical school residency programs have continued to work on the newly dead, before the embalming process, for procedures where the tactile feel of natural skin and anatomical structures are needed. These procedures include endotracheal intubations, central line placements, thoractomy, chest tube placement, venous cutdowns, and cricothyrotomy (Fourre, 2002; Iserson, 1993). According to the sparse literature, most of these programs do not request consent to perform on the newly dead.

Forensic anthropological use of the newly dead involves a donor donating their body to decompose at a body farm to study decomposition rates. The newly dead are laid out in various configurations, including, but not limited to: clothed/unclothed, placed in

containment structures, wrapped in plastic, and buried, allowing researchers to estimate forensic decomposition rates for criminal and forensic investigations. Donors gift their bodies specifically to the farm, indicating a mutual consent for use (Shirley, Wilson, & Jantz, 2011).

Statement of the Problem

With the variability of gross anatomy structures between one person and the next and the tissue tactile differences between embalmed cadavers and unembalmed cadavers, unembalmed cadaver clinical training is on the rise within the United States. As the use of cadavers is inherently controversial, the ethics, safety, and legal implications must be considered by institutional officials. What is not understood is how institutional officials must balance the research/teaching need with the societal expectations of conducting this research/training in an ethical, safe, and legal manner. Extensive research has been conducted on ethics in relation to consent or donation of the body for scientific purposes (Burns, 2007; Giordano, 2005; McCullough, 2007; Morag et al., 2005; Wicclair, 2002) and on legal matters or laws concerning cadaver use (Kurtz, Strong, & Gerasimow, 2007; The National Conference of Commissioners on Uniform State Laws, 2008), while little recent literature has been found on the safety of using unembalmed cadavers unless related to autopsy (Bastian & Jennings, 1984; Cahill & Freeland, 1992; Cavanaugh & King, 1990; Nolte, Taylor, & Richmond, 2002; Nolte & Yoon, 2003; Wilson, 2006). While these studies have described ethical issues with the donation process, use of primarily embalmed cadavers, or safety in regard to autopsy, there is little research that describes how institutional officials actually perceive liabilities in the areas of safety, ethics, and law surrounding the use of fresh cadavers for educational purposes. Exploring

the manner in which institutional officials address these factors will result in information that is valuable to educational leaders, safety personnel, and clinical/research coordinators. This information will be used to improve programs and communication to alleviate institutional liability when using the newly dead for educational purposes.

Purpose of the Study

The purpose of this study was to explore how institutional officials perceive the safety, legal, and ethical liability issues and mitigate potential problems regarding the use of the newly dead in clinical training programs and/or forensic anthropological research. There is an inherent balancing act between the needs of the donor and the donor's family and the needs for the advancement of medical research and training. How do administrators achieve this balance? Research, in regard to safety, has been identified in the area of autopsy; what is lacking is research in safety in the use of unembalmed bodies for clinical training and forensic research purposes (Bastian & Jennings, 1984; Cahill & Freeland, 1992; Cavanaugh & King, 1990; Nolte et al., 2002; Nolte & Yoon, 2003; Wilson, 2006). Extensive research has been conducted on ethics in relation to consent or donation of the body for scientific purposes (Burns, 2007; Giordano, 2005; McCullough, 2007; Morag et al., 2005; Wicclair, 2002) and on legal matters or laws concerning cadaver use (Kurtz et al., 2007; The National Conference of Commissioners on Uniform State Laws, 2008). While this research has a broader base than safety, the literature has not been analyzed in the totality of encompassing safety, ethics, and legal liabilities under one study. This study adds to the literature and can be used to assist institutional officials in developing safety, ethical and legal programs to alleviate these liability issues.

Research Design

In order to explore the intersection of these three issues, legal, ethical, and safety considerations in utilizing the newly dead in clinical training and forensic research, a descriptive multiple case study research design was chosen. Case studies are used when the research goal is to study a bound situation in depth. It is also used to capture the uniqueness of a situation, rather than test a particular hypothesis for the purpose of generalization (Hammersley & Gomm (2000)). This study focused on two cases: one well established program that uses donated and unclaimed bodies to conduct medical research and training; the other, a newer facility where forensic anthropological research is conducted. Although distinct in their purposes, both cases represent successful programs that use unembalmed bodies.

The research questions which guided this study, were:

- 1) How do institutional officials perceive liabilities in regard to potentially ethically or politically charged research and education endeavors?
- 2) What safety and health considerations need to be addressed when allowing research and/or clinical training on the newly dead?
- 3) What ethical issues and legal considerations are of concern when using the newly dead and what programs and/or processes are put in place to mitigate these issues?

Significance of the Study

This study provides valuable insight into successful implementation of programs dedicated to ensure ethical, safety, and legal considerations are met in the use of the newly dead. The results of the study contribute to the literature on how to understand and

mitigate safety, legal, and ethical issues when using the newly dead for clinical training and forensic research. The findings from this study (a) contribute to an understanding of how institutional officials perceive and mitigate liabilities in regard to institutional programs using the newly dead; (b) render suggestions for institutional officials to influence better anatomical donation programs with informed consent; (c) provide guidelines for safety programs to identify hazards, educate the affected employee about the hazards, and reduce health risks to institutional physicians, residents, researchers and other faculty and staff members working with the newly dead. This study contributes to the limited literature on safety, legal, and ethical considerations in the use of the newly dead in clinical training and forensic research.

Definition of Terms

The following terms and definitions clarify the terminology related to this study:

Cadaver

A cadaver is described as a dead body or a corpse (Venes, 2009, Kindle Location 14816).

Central Line Placement

A central line placement is where a catheter is inserted into the superior vena cava to permit intermittent or continuous monitoring of central venous pressure, to administer fluids, medications or nutrition, or to facilitate obtaining blood samples for chemical analysis (Venes, 2009, Kindle Location 16828-16829).

Chest Tube Placement or Insertion

A chest tube insertion is a procedure to place a flexible, hollow drainage tube into the chest in order to remove an abnormal collection of air or fluid from the pleural space (located between the inner and outer lining of the lung).

Cremins

The remains after the body has been prepared for burial by cremation [contraction of *cremated remains*] (Venes, 2009, Kindle Location 23513).

Cricothyrotomy

Cricothyrotomy is an emergency surgical airway medical procedure involving an incision between the cricoid and thyroid cartilages in the midline of the anterior neck (Venes, 2009, Kindle Location 23583).

Disarticulation

Disarticulation is defined as separating the body through amputation at a joint (Venes, 2009, Kindle Location 28491).

Embalmed or embalming

Embalmed or embalming is the preparation of a body or part of a body for burial by injecting it with a preservative such as a 4% formaldehyde solution. This is usually done within 48 hours of death (Venes, 2009, Kindle Location 31634).

Exposure

Exposure is the contact with an agent able to cause disease or injury, such as a bacterium or other contagious microbe; a chemical; an infected animal or person; or a physical agent, such as a radioactive source (Venes, 2009, Kindle Locations 35244-35246).

Endotracheal Intubation (ET)

Endotracheal intubation is where a catheter is inserted into the trachea to provide or protect an airway. Although an ET is often thought to be the most secure and definitive airway, ETs use in emergencies may be complicated by misplacement (e.g., in the esophagus instead of in the trachea), displacement (e.g., during patient transport), or injury to the airway (Venes, 2009, Kindle Location 32807).

Fixed Tissue

Fixed tissue is biological tissue where a chemical process has preserved the tissue from decay (usually with a fluid containing formaldehyde). The fluid functions to alter the protein within the tissue creating covalent chemical bonds between proteins, thus holding off natural decomposition.

Formaldehyde

Formaldehyde is a colorless, pungent, irritant gas (HCOH) commonly made by oxidation of methyl alcohol, the simplest member of the aldehyde group, used as a tissue preservative in the aqueous solution of formalin (Venes, 2009, Kindle Location 38152).

Formalin

Formalin is an aqueous solution of 37% formaldehyde, used as a tissue preservative. It is carcinogenic (Venes, 2009, Kindle Locations 38152-38155).

Frame

Bolman and Deal (2008) consider that a frame is a mental model or a set of ideas and assumptions that help a person understand and negotiate particular issues. These frames are built over time as a person develops beliefs, values, practices, and artifacts

that work. Bolman and Deal (2008) stipulate that these frames anchor the organization's identity, culture, and sense of self.

Infectious Disease

An infectious disease is capable of being transmitted with or without contact; pertaining to a disease caused by a microorganism; producing infection. Any disease caused by growth of pathogenic microorganisms in the body (Venes, 2009, Kindle Locations 50377-50380).

Institutional Officials, Administrators, and/or Officers

Institutional officials, administrators, and/or officers, used synonymously throughout this study, are individuals who plan, organize, direct, and control human or material resources in public service organizations (*e.g.*, schools, churches, hospitals, prisons, etc.).

Institutional Review Board (IRB)

An oversight committee that governs or regulates medical investigations and/or research involving human subjects. The purpose of the board is to protect the rights and health of participants. (Venes, 2009, Kindle Location 51176).

Personal Protective Equipment (PPE)

As defined by Occupational Safety and Health Administration (OSHA), personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to a variety of hazards. Examples of PPE include such items as gloves, foot and eye protection, protective hearing devices (earplugs, muffs) hard hats, respirators and full body suits (U.S. Department of Labor, Occupational Safety and Health Administration, 2003).

Phenol

Phenol, or carbolic acid, in nature exists as a white crystalline solid, but is encountered within mortuary facilities as a liquid in a solution with eight-percent water. Phenol has a pungent odor and is weakly acidic. The use of phenol in embalming, results in superior disinfecting and sanitizing. Phenol is also a very effective anti-fungal agent, used as a fungicide and mold inhibitor (Bedino, 1994).

Preparator

A preparator is a person who prepares specimens or exhibits for scientific study or display.

Thoractomy

Thoracotomy is a surgical incision of the chest wall (Venes, 2009, Kindle Locations 99575-99576).

Triangulation

The purpose of triangulation is to increase accuracy and ensure validity of the data. To achieve methodological triangulation, multiple data sources are used, such as, observations, interviews, and document review (Stake, 1995).

Unembalmed or Unfixed Tissue

Unembalmed or unfixed tissue can include cadavers or tissues that have not been chemically processed (i.e., embalmed), thus not delaying the decomposition process. As embalming desiccates the tissues, unembalmed or unfixed tissues are used as the feel of the tissue or body is similar to tissue or bodies that are still living.

Venous Cutdown

A venous cutdown is a surgical incision in a vein to place a catheter to permit intravenous administration of fluids or drugs. It is used in patients with vascular collapse when gaining percutaneous access to the circulation is difficult; however, this procedure is usually tried only when subclavian, jugular, or femoral access cannot be established (Venes, 2009, Kindle Locations 105497-105500).

Theoretical Framework

With the emphasis on accountability in administration of programs in education and with the need to ensure the health and safety of the institutional workforce, organizational theory is considered to be vital in regard to implementation of institutional programs that mitigate liability. To organize this study and understand the organizational theory and behavior of the programs/processes which are implemented, the theoretical framework for this study used the four frames as authored by Bolman and Deal (2008). Bolman and Deal (2008) stipulate that four frames can be reviewed in organizational management, theory, and behavior. These four frames are structural, human resource, political, and symbolic. To encourage and succeed at implementing change within an organization, an effective leader must rely on multiple frames and acknowledge each frame as a source of strength or weakness. By acknowledging the strengths and weaknesses of each frame, an effective leader can initiate the process of reframing, which includes modification of one of the frames to align the organization with common goals and values.

Two frames, the political and symbolic frames, were used within this study to analyze the interview and document analysis data. The political frames include the goals,

structure, and policies which emerge from the ongoing process of bargaining and negotiating among common stakeholders. The symbolic frame establishes that culture and tradition form the way an organization develops and operates. This is especially true in regard to the medical culture and the paternalistic view that is still found in the medical community (Bauchner & Vinci, 2001). These frames helped structure the study within the data collection and analysis portions to describe those items that have been reframed over time and continue to evolve to mitigate liability when working on the newly dead.

Limitations

Limitations to the research included that data was gathered at only two institutions that have established clinical training and forensic research programs. Both institutions have been using the newly dead for a number of years, but there was a limitation to the amount of data gathered. The institutions included in this study are located in different states within the United States, not allowing cross-case analysis across state laws, but a comparison of the various laws between the states. Environmental reports and/or surveys were not available for analysis, therefore these factors were not considered in this study.

Delimitations

The delimitations utilized in this study were determined by a desire to gain a better understanding of how ethical and safety issues are mitigated when using the newly dead for clinical training and forensic research. As such, only participants who were conducting clinical training and forensic research using the newly dead were included in the data collection process. Clinical training participants included only one university institution that currently allows training on the newly dead. Participants for the use of the

newly dead on forensic research involved one anthropological research facility, as there are only four of these facilities operational within the country.

A second delimitation was that the study included only one clinical training facility and one forensic research facility as participants. Due to the nature of the research, only institutions that would share knowledge on their anatomical donation programs and who were willing to assist in implementing a new program at another institution were chosen.

A third delimitation was that the researcher needed to be aware that ethical issues surrounding the use of the newly dead are inherently controversial; interview questions/responses were constructed or formulated that would not be construed as judgmental to the institutions' programs. Furthermore, as the use of the newly dead and the programs associated with these uses are evolving, the research reflected this.

Assumptions

This study included the following assumptions: (a) data collected allowed analysis on whether the program is effective in mitigating liability issues to the institution of higher education; (b) participants understood the concepts asked and gave accurate responses for their situations; (c) the data was interpreted accurately and reflects the perceptions of the respondents.

Organization of the Study

This dissertation is organized into five chapters. Chapter I includes the background of the study, statement of the problem, purpose of the study, research design and questions, significance of the study, theoretical framework, limitations, delimitations and the assumptions of the study.

Chapter II presents a review of the literature, which includes ethical theory, ethical issues, safety considerations, and legal theory and considerations when using the newly dead for clinical training and forensic research. Chapter III describes the methodology used for this research study, which includes the selection of participants, instrumentation, data collection and data analysis procedures.

Chapter IV presents the study's findings, including descriptions of the two cases studied, the common themes that emerged from the cases, and the cross-case analysis between cases. Chapter V provides the results of the research questions, discussion of the findings and their relation to the theoretical framework, implications of the findings for theory and practice, and recommendations for future research.

CHAPTER II

LITERATURE REVIEW

Introduction

This chapter presents the rationale for conducting the study on how institutional officials perceive legal, ethical, and safety liabilities when using the newly dead in clinical training and forensic research. Medical ethicists/bioethicists have studied the ethics for using the newly dead; lawyers have created laws concerning donation programs; and safety professionals have studied the health risks of personnel while conducting autopsies. This study brought together all three areas, legal, safety, and ethics, to describe how officials perceive these issues and the liabilities that are inherent with these issues. This is necessary in order to understand how officials developed and implemented programs and procedures needed to mitigate and protect the institution, the donor, and the institutional personnel. To make this study complete, literature was explored to describe the history of the laws, requirements regarding donor programs, the ethics of consent, and the possible safety risks when working on the newly dead.

It is important to recognize that these three foundations, law, ethics, and safety, are critical to implementing programs; as well as recognizing that the programs are necessary to allow transference of medical and forensic knowledge and growth in skill competency, while protecting the donor's gift, the workforce, and the institution's interest. The balance is critical in order to achieve desired results. This study was designed to understand how this balance has been achieved at two institutions. To accomplish this, the following questions guided the study:

- 1) How do institutional officials perceive liabilities in regard to potentially ethically or politically charged research and education endeavors?
- 2) What safety and health considerations need to be addressed when allowing research and/or clinical training on the newly dead?
- 3) What ethical issues and legal considerations are of concern when using the newly dead and what programs and/or processes are put in place to mitigate these issues?

Thus, this study sought to understand each component, or pillar of the program, and how institutional officials perceived and approached these components in conducting educational training and research.

The following review of literature represents the literature relevant to this research study, namely, legal, ethics, and safety. Specifically, Chapter II is organized into five sections: (a) history of cadaver use and anatomy laws, (b) legal issues concerning cadavers, (c) ethics, (d) safety – the risks of using cadavers, and (e) best practices.

History of Cadaver Use and Anatomy Laws

Cadavers have had a special status, within a historical context, ever since the Egyptians mummified the corpse for the afterlife. In fact, the first uses of cadavers for anatomical research were noted within the Egyptian culture in 300 BC (Roach, 2003). To improve the mummification process, King Ptolemy I encouraged Egyptian physicians to cut open bodies to determine how the bodies worked. One Egyptian physician, Herophilus, is said to have dissected over 600 prisoners, some of them while they were still living (Roach, 2003).

Cadavers, although non-living, have a unique respect in western society. A cadaver represents a physical human being before decomposition; feelings, emotions, and a natural action of protecting the body surround death. These emotions and feelings play into how, historically, cadavers have been treated. To have one's body defaced was considered one of the greatest punishments because the religious populace of the 16th-18th century believed in a literal rising from the grave. Dissected persons could not rise from the grave because the body was not whole. In addition, dissection of the body would exclude the person from heaven. The one exception to this practice was that criminal capital punishments included using the criminal's dead body for public and private dissection classes.

The importance of physical representation of the cadaver was also clearly ingrained in the culture by other punishments to the body. In 1752, a murderer to be executed could choose whether to receive gibbeting or dissection after death. Gibbeting was the process whereby the cadaver of the criminal was dipped in tar and hung in an iron cage for crows to eat. Thus, from the sixteenth century until the passage of the Anatomy Acts of the 1830's, the only cadavers legally available for dissection in Britain were those of executed murderers (Roach, 2003).

During this time, private anatomy schools and medical schools flourished. The constant supply of cadavers needed for these institutions could not be fulfilled by only persons executed for murder. Cadavers from people who had recently died were needed for dissection, as embalming had not been invented. With no embalming, the anatomical dissection class had to be completed within a few days of death due to the natural rate of decomposition. More and more bodies were needed as the schools grew in size. The

great shortage of bodies resulted in the crime of body snatching. Body snatching is robbing the grave of the body, leaving material wealth in the coffin; as opposed to grave robbing, which is stealing the valuables in the coffin or mausoleum. At this period in time, it was a crime to rob a grave, but not a crime to snatch a body.

In 1828 House of Commons testimony, it was noted that the London Anatomy School employed 10 full-time body snatchers, also known as resurrectionists. The resurrectionists supplied the school with 312 cadavers over a one year period. Each resurrectionist was paid \$1,000 per year, which was ten times the wage for an unskilled laborer at that time (Roach, 2003). If the school did not hire its own body snatchers, bodies were accepted by anatomists and school officials with no questions asked. For example, in 1828, two men, William Burke and William Hare, sold a body of a lodger to Robert Knox, an Edinburgh anatomist. The man had died of natural causes in William Hare's lodging house owing money (approximately four pounds). Robert Knox paid the two men seven pounds for the body and, after Burke and Hare realized the potential profit of providing additional corpses to the anatomist, they sold Knox fifteen additional bodies, belonging to people who they murdered. The soon-to-be dissected were killed through intoxication of spirits until Burke and Hare could easily smother them to death. Burke and Hare were caught and Hare turned King's evidence against Burke (Teward & Patterson, 2002). Burke was hung in front of a crowd of 25,000 and, in keeping with the law of the day, was dissected. The following day, the laboratory opened up for 30,000 people to witness Burke's dissected body. The judge further ordered Burke's cadaver to be made into a skeleton, which currently resides at the Royal College of Surgeons in Edinburgh, along with several wallets made up from Burke's skin (Roach, 2003).

These events, in addition to the public outcry and panic, culminated in the promulgation of the first anatomy law passed in Great Britain, the Warburton Anatomy Act of 1832 (Teward & Patterson, 2002). All anatomists and medical schools were required to procure a license in order to practice anatomical dissections. An inspection bureau was organized to ensure that bodies used for dissection purposes were legally obtained. Schools were allowed legal access to all unclaimed corpses, thereby alleviating the financial incentives of the body snatchers. The next of kin was also allowed to donate dead family members in exchange for burial expenses; the burial being held after the dissections were finished.

Within the United States, the history of cadaver use was similar to Great Britain. The first formal course in anatomy was taught at the University of Pennsylvania in 1745 (Teward & Patterson, 2002). As in Britain, the proliferation of medical schools and anatomical laboratories resulted in body snatching becoming common practice in the late 1700s-1800s. Riots occurred between 1765 and 1852, the most famous which was the New York Doctor's Riot of 1788 (Teward & Patterson, 2002). A doctor working in his anatomy laboratory waved the arm of a cadaver at a young boy peeking in the window. The boy ran home to his father, who in turn ran to the cemetery to ensure that his wife's body was still buried, as she had died the previous day. The body was gone. The laboratory was burned down and seven rioters were killed. In 1789, a law was passed in New York forbidding body snatching and the use of criminals for dissection.

As laws pertaining to the use of cadavers in the United States were made at the state level, inconsistencies between the development and implementation of these laws differed between the states. Jonathan Knight, Yale's first professor of Anatomy and

Physiology obtained cadavers when there was no legal way to do so in Connecticut. In January 1824, when the grave of 19-year old West Haven resident, Bethsheba Smith, was found empty, a public outcry against Yale ensued (Feinstein, 2004). The police found a shallow grave with a young female body buried in the basement of the medical school. The next day, 600 angry residents of New Haven threatened to storm the school. The Connecticut legislature passed a law allowing unclaimed bodies from the state hospitals to go to Yale, thereby attempting to put American body snatchers out of business.

Depending on the cases and locations of body snatching, state legislation was passed to allow unclaimed cadavers to be used at medical schools and universities, while also designating body snatching as a punishable crime. The occupational activity of body snatching was also affected with the invention of the embalming process. Embalming was first widely practiced during the Civil War. By holding off the rate of decomposition, soldiers who died on the battlefield could be sent home to their families for burial. After the war, the embalming process was improved and became a normal accepted practice following death.

In 1968, the Uniform Anatomy Gift Act (UAGA) attempted to provide consistent guidance to the states on legislation and regulations that should be in place for anatomical gifts (The National Conference of Commissioners on Uniform State Laws, 2008). This guidance provides for the adoption of uniform laws between the states on cadaver use and donation. The UAGA allows a person the right to donate or bequeath his or her body to medical science and education (Kurtz et al., 2007). This voluntary process has minimized the use of unclaimed cadavers and brought a positive emotion to the donation of cadavers for dissection purposes (Teward & Patterson, 2002).

Legal Issues Concerning Cadavers

Laws Concerning Human Remains

Laws, simply put, are principles and/or rules regulating societal members. Noncompliance with a law usually results in enforcement of a penalty for unacceptable behavior. Laws are written and/or promulgated when needed to provide a structure to determine socially acceptable actions or to define which actions are not socially acceptable. Laws are needed in regard to cadavers, as activities have been conducted that were not ethical and/or socially acceptable concerning human remains. These activities include organ harvesting for personal financial gain, distribution of illegally harvested organs, disposition of human remains not in the accepted norm, and questionable research endeavors on cadavers. All of these activities have increased scrutiny and driven legislation to protect the physical embodiment of a loved one.

In 2002, the Tri-State Crematorium in Noble, Georgia was found to have decomposing bodies stacked like cord-wood in sheds, disposed of in neighboring forests, and hidden in shallow graves (Hart, 2004; Rosen, 2004). The U.S. Environmental Protection Agency made this gruesome discovery while investigating a complaint. The owners of the crematorium had decided not to repair the retort furnaces because of cost, but continued to receive bodies for cremation. Burned wood chips were submitted to families in replacement of loved ones' ashes. The subsequent investigation identified 334 bodies on the crematorium grounds and in the lake. The owner, Ray Brent Marsh was sentenced to 12 years in prison, charged with 787 felony counts including theft by deception, abuse of a corpse, burial service fraud, and making false statements (New York Times, 2005). In 2004, 1,600 families were awarded \$36 million from the funeral

homes that had contracted with Tri-State Crematorium to complete the cremations, and \$80 million from Marsh's home insurance company (Hart, 2004).

Institutions of higher education have also had legal issues in relation to human remains. In 2004, the UCLA willied-body program coordinator, Henry Reid, was arrested and charged with grand theft for selling hundreds of cadaver parts donated to the program (Ling, 2004). The illegally harvested organs were taken from the UCLA campus through a partnership between the willied-body program coordinator and a middle-man distributor, Ernest Nelson, who re-sold the body parts to two large medical research companies for personal financial gain of over \$1 million. Ernest Nelson claimed that all serological testing was completed by UCLA to ensure that the organs were free from infectious diseases. UCLA officials were not aware of the testing and stated that they, "...were profoundly disappointed and surprised to learn that Reid had apparently deceived them, as well" (Ling, 2004, p. 532). Lawyers for the donor's families stated that the large medical company, Johnson & Johnson, had developed product lines potentially increasing profits to the company by \$70 million (Cohen, et al. v Johnson & Johnson, 2006; Szymanski et al. v. NuVasive Inc., 2006). A class action lawsuit was filed against the Regents of the California Educational System in order to compensate the families for the increased value of the donation and emotional distress, as they did not know what had occurred with their loved ones' remains (Baines, et al. v Regents of University of California, 2005). A separate lawsuit was also filed against Johnson & Johnson. Henry Reid pled guilty to grand theft and received a sentence of 52 months. This was a reduced sentence in agreement for his corroboration against Ernest Nelson. Retribution to the

Geffen School of Medicine was set at \$500,000. Ernest Nelson received a 10-year sentence for multiple charges, including grand theft and tax evasion (Lin, 2009).

In 2006, the Food and Drug Administration permanently closed the organ and tissue bank Biological Testing Services (BTS) in Brooklyn, New York. The owner of BTS had contracted illegally with eight funeral homes to acquire organs from bodies; the most prominent deceased victim was Masterpiece Theater host Alistair Cooke (Warren, 2006). These organs were acquired without consent, without serological testing, and taken from potentially unacceptable donors. Death certificates and consent agreements were falsified and forged. This case resulted in 10,000 people receiving letters informing them that they may have been a recipient of one of the illegally acquired organs. The letter also offered testing for infectious diseases, including HIV and Hepatitis B.

In addition to this type of unethical and unlawful behavior, the determination of death and the successful transplant of human organs have also driven the enactment of laws to protect the living and the donor of the cadaver. Prior to the 1900s and the invention of the stethoscope, death was certified by undertakers or embalmers. Inaccuracies of predicating death resulted in traditions such as wakes, where mourners stayed awake with the deceased to make sure the decedent was in fact dead (Webster, 2011). The Greeks and Romans believed putrefication was the only standard to determine death. Putrefication mortuaries were part of the burial rite where the dead would be stored until putrefication of the body occurred, usually within 4 days of the actual death. In the latter half of the 19th century, Germans carried on this tradition through “waiting mortuaries” to ensure that the individual had indeed died. To avoid

being buried alive, a string with a bell was tied to the cadaver to alert the attendant if there was any movement, originating the saying, “saved by the bell” (Roach, 2003).

At the start of the 20th century, U.S. state laws were enacted to require physicians to determine and certify the patient had died. State laws have proliferated as organ transplants have become increasingly possible. Laws were enacted to ensure that the certifying physician was not also the transplant physician, thus preventing the possibility of the physician hastening death to harvest organs for transplant purposes (The National Conference of Commissioners on Uniform State Laws, 2008).

The laws concerning whole-body donation are intertwined with transplant organ donations, as both activities are considered anatomical gifts. As such, the organ donation laws have evolved recently to describe the anatomical gift program. Perhaps the most controversial definition in regard to anatomical donation is determination of death. In 1981, a Uniform Declaration of Death Act (UDDA) was written to guide state legislation to approve whole brain death criteria as an alternative to heart/lung death. The UDDA established two criteria for determining death: 1) when the circulatory and respiratory functions irreversibly cease or 2) cessation of all functions of the entire brain (Truog, 2007; President's Commission for the Study of Ethical Problems in Medicine and Biomedicine, 1981). The UDDA was not universally popular in that bioethicists and philosophers felt the UDDA encouraged legislation that promoted organ transplantation too early in the death process (Miller & Truog, 2008). Whole brain death criteria remains controversial, not only because a brain-dead person exhibits themselves as a living person, but also because the standards were established from a study conducted with only 12 subjects (Truog, 2007). Brain-death also is controversial in that it could violate the

dead-donor rule. The dead-donor rule, an ethical principle, refers to two ethical norms that govern organ transplantation: (1) vital organs should only be taken from the dead, and (2) living patients should not be killed for organ procurement (Robertson, 1999). As this definition of death has curtailed the number of organs available for transplant, the guidelines have been expanded to include non-heart beating donors, where organs can be taken from a critically ill patient 2-5 minutes after the heartbeat has stopped in a medically controlled environment (Zamperetti, Bellomo, & Ronco, 2003; Bell, 2003). As an ethical principle, the dead-donor principles are constantly being evaluated.

The time of death matters because death and the definition of death create the basis for all anatomical gift or willed-body donation programs. These programs came into being later in the 20th century with the introduction of successful organ transplants. Donation for teaching through anatomical dissection was completed through giving educational institutions unclaimed bodies. Currently, bodies are donated 90% of the time for use for anatomical dissection, research and teaching (Cantor, 2010) through programs developed using the UAGA guidelines.

History of the Uniform Anatomical Gift Act

The National Conference of Commissioners on Uniform State Laws (NCCUSL) is a nonprofit, unincorporated association comprised of commissioners from each state and U.S. territory. The purpose of the commission is to study and review the laws of each state and to determine which areas should be uniform across the nation (The National Conference of Commissioners on Uniform State Laws, n.d.). After Dr. Christian Barnard's successful heart transplant in 1968, the NCCUSL proposed and drafted statutes to use as guidelines in the development of state laws specifically

addressing anatomical gifts. The Uniform Anatomical Gift Act (UAGA) framework has been revised twice since 1968, once in 1987 and again in 2006. As anatomical gifts are a states-right issue and not federally mandated or regulated, state programs since 1968 have evolved specifically for each state and are not uniform across the nation. Although the 1968 UAGA was used extensively to develop state statutes, the 1987 version was only adopted by 26 states (The National Conference of Commissioners on Uniform State Laws, 2008). The 2006 Revised UAGA encourages states to enact laws to enforce penalties on abuses involving falsification of donation or refusal to donate documents. The act also suggests felony penalties for those who financially gain by selling body parts illegally harvested to research institutions (The National Conference of Commissioners on Uniform State Laws, 2008). The penalties suggested are felony criminal time and monetary penalties of up to \$50,000 (The National Conference of Commissioners on Uniform State Laws, 2006).

Section 11(a)(1) of the UAGA guides the states in the development of a willed-body and/or donation program (The National Conference of Commissioners on Uniform State Laws, 2008). This section stipulates that an anatomical gift may be made to the following: a hospital; accredited medical school, dental school, college or university; organ procurement organization; or other appropriate person, for research or education. The UAGA also suggests a donor registry, stipulating that the system must be implemented so that the donor can make a declaration to donate, can amend this declaration, or can revoke their right to become an anatomical gift (Kurtz et al., 2007). Most states use a registry system through the state Department of Motor Vehicles.

Donation of bodies for educational and research purposes are the result of pre-mortem legal decisions made by the donor or the decedent's next of kin. The legality of these decisions is possible through the establishment of donor programs under state statutes and uniform anatomical gift act laws. As human donation programs have evolved, a number of issues have been addressed and are written within the literature concerning whether a cadaver has legal rights and, if so, what these legal rights constitute.

The Cadaver as Legal Property

A main legal issue is whether a dead person is property, as the cadaver is no longer living and becomes *thing*-like. Although the dead are passed to the next of kin, similar to property, decisions made by the dead pre-mortem are carried through to postmortem. Thus, cadavers are not property, *per se*, but treated as *res nullius*, something that cannot be owned. This legal treatment of cadavers originates from England, where English common law first established that control of the dead and burial to be under the authority of the ecclesiastical courts and the church. Thus, in England, the corpse has never been treated as property (Cantor, 2010). The civil courts of the U.S. have followed the British model, ruling that the dead are not property, but deserve a *special status*. This special status exists from the time of death until sufficient decomposition has occurred; whereby, the cadaver no longer resembles a unique living person. During this time of special status, family and friends have attachments and emotions toward the cadaver, allowing the cadaver to retain what Cantor (2010) calls a *quasi-human* character. This character is reflected within the law.

Legal decisions are determined by a self-determination or autonomy of person. This freedom or liberty allows the person to make a pre-mortem decision concerning postmortem disposal. This nature of autonomy also allows donors to make advanced binding decisions, even though the donor does not know the precise circumstances that will exist at their moment of loss of competence and/or death (Cantor, 2010). For example, one of the first state laws enacted on pre-mortem decisions, New York State Statute of 1881 states, “A person has the right to direct the manner in which his body will be disposed after death” (New York State Health Law Section 4201, 1881). American common law establishes that human remains have a special status and that a decedent’s kin would likely experience extreme distress if there were interference of these wishes (Cantor, 2010).

Entitlement Legal Rights of the Decedent and Decedent’s Family

Other rights of the cadaver include entitlement rights such as the right of repose or the right to be undisturbed; this is a commonly accepted right within most cultures. These entitlement rights also include the right of privacy and confidentiality, which at times can create problems within a donation program. Medical records are commonly requested to assure no infectious diseases are present in the body, but unless stipulated within the donation program, can often not be given to the recipient of the cadaver. Names and faces are covered and kept confidential, to protect the living identity of the cadaver.

These rights are commonly known as the rights of the dead. The rights of dignity and confidentiality extend to the decedent’s family, which includes the right of privacy. An example of legal rights for the decedent’s family is one of privacy. In 2001, a

Freedom of Information Act (FOIA) request was submitted to the White House for photos of White House counsel, Vince Foster, who had committed suicide while in office. The U.S. Supreme Court upheld the nondisclosure of the photos, citing family interests in privacy through interpretation of the FOIA laws, “FOIA recognizes surviving family members’ right to personal privacy with respect to their close relative’s death scene-images”. Furthermore, “we think it proper to conclude from Congress’ use of the term ‘personal privacy’ that it intended to permit family members to assert their own privacy rights against public intrusions long deemed impermissible under the common law and in our cultural traditions” (National Archives Records Admin v Favish, 2004, p. 9). This interpretation of the law solidified the family entitlement right to privacy in regard to the decedent, allowing the government to deny requests for information on assassinations, such as autopsy reports and photos of government officials or well-known individuals (e.g., John F. Kennedy, Martin Luther King, Jr.).

The Liberty to Maintain Dignity in Death

Even in death, while the body retains a recognizable form, it commands the respect of dignity. This definition of dignity is a cultural trait and is demonstrated in how the living treats the newly dead. In western culture, viewings are held to facilitate *closure* to the living and, at these viewings, mourners commonly kiss the cadaver, talk soothingly to the body, or caress the face. Conversations are frequently conducted with the dead at the gravesite. When autopsies are requested, the family often states the decedent has “suffered enough”, although the cadaver is beyond suffering. These attributions are important in regard to how donated cadavers are treated and in regard to protocols and procedures on the type of research conducted on the dead.

Typically, research endeavors that may be considered against the donor's values are not covered under the donation programs, even those programs that follow the UAGA guidance. The use of cadavers after donation has always been under the purview of the institution that accepts the donation. The donor and family are often not told what will happen with the body. Case in point, Tulane University, in 2003, sold cadavers that had been donated to the institution for research and teaching purposes. The donated cadavers were distributed to a body broker, who, in turn sold the cadavers to the Army. The Army used the cadavers for testing combat boot designs in response to landmine explosions. "If my mother had known that her body could be sold like it was nothing, she never would have donated it", said a 22-year old Louisiana woman, who joined a class-action lawsuit against both Tulane and the brokerage company (Mangan, 2004, p. A27). Karmen L. Schmidt, Director of the Oregon Health & Science University body-donation program stated, "They (donors) want to be sure that body parts aren't being farmed out to other companies, and that no one is profiting from them" (Mangan, 2004, p. A28). Mangan (2004) reported that the continued cadaver scandals have harmed the public's trust in higher education institutions, suggesting that better oversight is needed in order to verify that donated cadavers are legally and ethically obtained and used.

Ethics

René Descartes, often considered the Father of Modern Philosophy, argued that human beings are made of two *things*: the *res cognitans* (the thinking thing) and the *res extensa* (the matter) (Giordano, 2005). Within Descartes treatise, these two things are different entities with two different statuses. The thinking thing is viewed as superior to the matter, or simply put, mind over matter. In contemporary terms, this personhood is

defined as being self-aware, having a mental capacity, and a conscience (Singer, 1995). Likewise, the matter, or the body, should be insignificant in the totality of the composition of a human being. However, this argument has not been the case historically. In 1999, the Alder Hey Children's Hospital in Liverpool was investigated for removing whole organs from children during autopsy without the parents' knowledge and consent (Bauchner & Vinci, 2001). This scandal resulted in the modification of Great Britain's Human Tissue Act, placing greater oversight over physicians collecting tissue samples. If the body was truly insignificant, the Alder Hey Children's Hospital case would not have caused such public outrage.

In the United States, in regard to research and clinical training protocols, the federal policy that protects human research subjects defines a *human subject* as a living individual. Thus, research involving the newly dead does not constitute human subject research and is not subject to human research protections, including the requirement for institutional review board approvals. The body, not human, is again considered insignificant in the totality of the composition of a human being.

The Body as Ethical Property

If the body is insignificant and can be used for societal good, can it be called property in an ethical sense? If the body is property can it be used by society, as society sees fit? Giordano (2005) listed two separate arguments. The first argument is Epicurean in nature in that dead is dead. Once *I* die, the issue of ownership is irrelevant, because there is no longer any *I* when *I* am dead (Giordano, 2005). Thus the first argument is that I have no rights to decide about my body because I am dead, thus, the body is property.

The second argument is religious-based in that the body is ultimately God's property. As God's property, people are precluded from tampering with a body.

Although Giordano (2005) admits the two arguments are incompatible with allowing families to have any *property rights* over a loved ones' body, she contends (outside of the two arguments) that there is a sense where the deceased's body belongs to the relatives and the family is entitled to be *in charge* of that body. As the body retains the physical representation of what was once a living human, the family has an emotional tie to the body. This physical manifestation of what once was a specific living human gives the family the feeling that the cadaver belongs to them and so they assume moral responsibility for the cadaver (Giordano, 2005). Currently, laws on cadaver treatment and disposal reflect this alternative argument. The family has ultimate responsibility for the disposal of the body.

Although laws support this alternative argument, other additional ethical questions have been raised concerning tissues taken and used without individuals' consent and the use of unclaimed bodies. For instance, a person enters the hospital for a medical procedure and tissue is removed during the course of treatment. This tissue is then used by researchers to develop cell lines or to create other potentially beneficial solutions to a medical issue. Some lawyers and researchers argue that there is no need to inform people that body parts have been removed in the course of treatment and subsequently used for research or commercial purposes, so long as the patient is not exposed to any physical risk (Andrews, 1986). This is common practice, in that most hospitals have patients sign consent for transference of tissues from the individual to the hospital during any surgery or biopsy. The HeLa cell line case represents this practice.

Henrietta Lacks' cervical tumor has been used to develop a self-sustaining cell line (Skloot, 2010). Likewise, in 1984, UCLA School of Medicine created the commercially valuable Mo cell line from a leukemia patient, John Moore, without obtaining consent (Andrews, 1986). Similarly, Gunther von Hagens, the inventor of biological tissue preservation technique, plastination, admitted that he openly accepted unclaimed bodies, from Chinese sources, without explicit donor consent forms (Tanassi, 2007). Dr. von Hagens has made these cadavers his property. Some of these bodies are found in the Body World exhibit that has traveled the globe. In all of these cases, the body (or parts of the individuals' bodies) it appears have become public commercial property without the consent of the individuals or their families.

Post-Mortem Harm vs. Societal Good

In taking body parts and creating a valuable commercial product, did this action harm the individual, as the individual is dead when the product becomes available? Wicclair (2002) defined harm to include any action or event that negatively affects a person's well-being. In regard to the dead, well-being includes the individual's pre-mortem desire or preferences. Although Epicurean beliefs encompass that harm only occurs with an existent or living subject, survivors can be harmed in relation to their personal expectations about the body (Tomasini, 2009). Changes to the grieving because of a hole left by their deceased loved one or a functional role change within the survivor's life because of the death (e.g., wife to a widow) was defined by Tomasini as a Cambridge change. This Cambridge change moves the locus of harm from the dead body to the dead body as it is experienced by the grieving. The bereaved cannot view the newly dead from the point of view as non-attached and objective (Tomasini, 2009).

Although the ethical issues in relation to post-mortem harm and property rights of the body are complex, studies have shown the clinical training on the newly dead show a societal good (Fourre, 2002; Tabas et al., 2005). Medical students become more confident and competent in training when procedures are performed on the newly dead. Cadavers are used because the newly dead are anatomically flexible and allow a tactile feel similar to live tissue.

Iseron (1993) further argued that it is society's responsibility to encourage practitioners to develop life-saving skills. If society wants competence, then knowing and respecting the deceased's wishes may be overridden for the good of society. In reference to the deceased's wishes or the deceased's autonomy, Giordano (2005) stated that societal good should be sought only while minimizing intrusions to an individual's autonomy. Within the Iseron and Culver (1986) article, Iseron argued that autonomy is a misapplied concept to a cadaver as the person is no longer in existence. In addition, as neither intubation nor percutaneous central line placement disfigures the deceased and the procedures need to be performed immediately after death, all trainings should be allowed without prior consent (Iseron & Culver, 1986). Iseron (1993) further stated that the current medical community practitioners commonly delay the pronouncement of death in order to teach or practice procedures, arguing that if it was acceptable in society without consent, that the declaration of death would be made at the correct time and thus, not cause the family any additional angst.

In contrast, within the Iseron and Culver (1986) article, Culver argued that by using the newly dead without consent pre-mortem or obtaining consent from the family, the medical community is committing deception. In addition, Morag et al. (2005) states,

“They (experts) argue that the discovery of these practices could erode trust between physicians and the communities they serve, and are reminiscent of the days of grave robbery” (p. 95). Bauchner and Vinci (2001) agreed with Culver’s argument (Iserson & Culver, 1986), citing the Alder Hey incident as an example that traditionally, doctors’ decision-making has largely been paternalistic. Consent guidelines are necessary to ensure that the decision does not emanate from an attitude of “doctor knows best”, but from shared decision-making (Bauchner & Vinci, 2001).

Consent

Consent is defined as agreement by an individual with sufficient or adequate information and if people do not understand the scope of their assent, then it cannot be said that their assent is informed consent (Wicclair, 2002). In regard to research and/or teaching on the newly dead, informed consent includes understanding of the scope and purpose of the research/training, the expected outcome, and the value for exchange of the use of donor’s body. Ethically, using the newly dead is justified only if consent was obtained from the deceased prior to death or from the deceased’s family (Wicclair, 2002). Wicclair (2002) viewed this as a personal liberty right and an individual privacy that should be maintained after death. Wicclair (2002) assigned the greatest weight to pre-mortem decisions and preferences that: 1) demonstrate respect for living persons; 2) promote the well-being of the living; and 3) that following the deceased’s wishes is accepted practice with respect to wills, burials, and organ donation.

Some members of the medical community do not agree. Iserson (1993) stated it is inconsistent to extend consent requirements for minimally invasive procedures. Citing the President’s Commission for the Study of Ethical Problems in Medicine, Biomedicine

and Behavior Research, Iserson (1993) stated that consent is not needed from kin if the procedures do not go beyond the normal scope of teaching. He further stated, "Simple as the concept is, corpses no longer are individuals, and they cannot be the basis for either autonomy or informed consent. They are merely symbolic"(Iserson, 1993, p. 262).

Wicclair (2002) viewed the deceased's body as more than simply for the symbolic value. For a period of time, the body was inseparable from the person. As such, the body, itself, is not insignificant. As the body is the physical presence of the loved one, family consent is needed when a pre-mortem decision was not made by the deceased. Consent demonstrates respect, not only for the deceased's wishes, but for the family's values. As the family is a social institution, asking consent relays respect, in addition to, maintaining family privacy and autonomy (Wicclair, 2008).

Other questions relating to garnering family consent is for the medical community to be aware of hindrances to assent. Orthodox Jewish people and people of other faiths believe in repopulating the body with the return of the Messiah (Giordano, 2005). Any training or research on newly dead of people who practice these faiths would offend their beliefs. Further, some family's psychological well-being is dependent on certain funeral rites in order for closure. Extended research or training that maims would ruin the family's expectation of the medical community and would hurt the opportunity for this family to grieve as naturally as possible (Giordano, 2005). When the deceased has not left consent, the family must be requested for consent, as they hold the responsibility for the body.

Presumed consent occurs when physicians follow the "don't ask, don't tell" rule of practicing procedures on the newly dead in regard to societal good without requesting

official consent from the family (Morag et al., 2005). For example, at Alder Hey Children's Hospital, the pathologists presumed consent to remove whole organs when the families agreed to tissue sampling to determine the cause of death (Bauchner & Vinci, 2001). Under the Uniform Anatomical Gift Act (UAGA) (The National Conference of Commissioners on Uniform State Laws, 2008), when an individual elects to be an organ donor at the Department of Motor Vehicles, the person agrees to the four purposes of UAGA. The four purposes include transplant, therapy, research, and education. Therefore, consent to donate includes the presumed consent to these four purposes. Some states have chosen to enact the full UAGA recommendations (*i.e.*, the four purposes) and some states have enacted laws whereby donors must specify the exact purpose of their donation (Wicclair, 2008).

Why don't physicians ask for consent? Wicclair (2008) posited that physicians operate from protecting themselves from family emotions, from their own emotional discomfort asking for consent, and from the possibility of being refused. A study conducted by Morag et al. (2005) showed that out of 303 deaths in Brooklyn, 102 allowed their deceased relatives to be used for clinical teaching, but 48% of the 303 respondents were initially angry that they were asked. Although anger has been shown to be an issue, relatives have consented to using their deceased relatives for clinical teaching practices. A study was conducted on newly dead infants where the study population consisted of infants who recently died at a neonatal intensive care unit at a hospital in Ohio (Benfield et al., 1991). At the time of the study, 55 infants had died. Of this study pool, only 44 families were requested to use their infant for teaching purposes, as 11 had been excluded due to emotional distress or other identified issues. Thirty-two families of

the 44 consented to allowing the hospital to use their infant for intubation training of residents and respiratory technicians (Benfield et al., 1991). The study research personnel explained to the families the benefit of the study and the families could see the benefit of allowing their deceased loved one to be used for clinical teaching practices. Thus, it appears that families do consent to use their dead loved ones when the benefit or value has been explained (Benfield et al., 1991).

From the Alder Hey Children's Hospital incident a number of lessons-learned were explored in the literature. The subsequent investigation found that within this hospital structure, greater oversight was needed and medical education and training on anatomy laws and consent process were warranted (Royal Liverpool Children's Inquiry, 2001). The suggested corrective action was to implement a research ethics committee to review physicians' work. The investigators of the Alder Hey incident also stated that the definitions between research and education were too close and that education becomes research frequently without acknowledgement. The report also listed a corrective action of educating doctors on how to obtain consent, as the parents stipulated that if asked, they may have allowed donation of certain organs for study. The parents indicated that they wanted to be partners in the decision-making process of what occurred with their children's organs.

Giordano (2005) agreed that if the general public is educated on why it is important for science to use the newly dead, that most people exhibit an altruistic behavior to help others. Giordano (2005) contended that the medical community should implement responsible choice, which includes an informed clear choice when either becoming a donor or when the family is asking to donate their loved-one. By education,

Giordano (2005) believed that informed consent can increase the numbers of newly dead for clinical training and research and solidify the trust in the medical community.

Morag et al. (2005) suggested a legislative approach to arrive at a preauthorized form of consent for permitting post-mortem procedures. By having this choice pre-mortem, family consent is no longer an issue. Fourre (2002) agreed that some advanced directive that is issued on a wallet card frees family from decision-making, plus relatives are less likely to consent for others than they are for themselves.

Similar to the recommendations from the Alder Hey incident, DeVita, Wicclair, Swanson, Valenta, & Schold (2003) proposed the creation of a standing committee to oversee research involving the dead at all medical teaching hospitals and schools. These committees would be separate from the Institutional Review Boards (IRB), but would have members from the IRB. These committees would review informed consent and protocols for working with the newly dead.

The ethics in working with the newly dead are complex and encompass not only rational thought, but emotional thought, as well. To ensure that all potential harms to families of the deceased and to the deceased's reputation, in addition to the reputation of the respective institution, DeVita et al. (2003) suggested that institutional officials acknowledge and implement programs to mitigate the following issues:

- if the body or bodily tissues are to be commercially valuable, then the family must be informed;
- no interference with important social or religious practices;
- no inadvertent release of confidential information could occur, so not to risk the deceased's reputation;

- ensure that any discovery of information that would adversely affect the family is communicated with the family;
- training and research on the newly dead does not interfere with normal hospital function or residency training or organ donation;
- research and training is valuable and demonstrates a societal good.

Informed consent with public education on the benefit of donation is essential in mitigating ethical issues when conducting clinical training or research on the newly dead.

Clinical Training Using the Newly Dead

Fourre (2002) conducted a study on Graduate Medical Education residency programs in emergency medicine. A survey was administered in order to identify which procedures were performed on the newly dead for clinical training; it also documented whether consent was obtained from either the deceased pre-mortem or from the family. Ninety-six of the 116 surveys were returned. Endotracheal intubation was the most commonly performed procedure. Endotracheal intubation is a technique whereby the placement of a flexible plastic tube is put through the mouth and vocal apparatus into the windpipe to maintain an open airway. Seventy-six percent of the respondents stated they “almost never” obtained consent from family members. Only four of the 96 institutional programs had written policies concerning conducting training on the newly dead (Fourre, 2002). This study documented that performing procedures on the newly dead is a common part of medical training in emergency medicine residency in the United States. The study also documented that consent is rarely obtained and policies concerning conducting these procedures on the newly dead appear to be lacking.

A study conducted with 33 fourth year medical school students assessed whether attendees to the class felt that their understanding of certain medical procedures increased when they completed training on the newly dead, if they felt their ability to perform the procedures increased, and if they felt it increased their comfort at performing the procedures (Tabas et al., 2005). The findings indicated that students had a significant increase in their understanding of, ability to, and comfort in performing the medical procedures. The authors concluded that these findings supported the values of the advanced emergency procedural training course using an unembalmed cadaver-based approach (Tabas et al., 2005).

Safety – The Occupational Health Risks of Using Cadavers

Occupational risk is the risk that workers can confront in their normal working duties. Occupational risks must be identified and prioritized to minimize hazards to employees as well as identify the liabilities for the employer. High risk or risks that may cause fatalities require the employer to engineer out the element causing the risk, put programs or policies in place to understand and mitigate or minimize the risk, or provide additional equipment to allow employees to safely conduct their job tasks. These occupational standards are located under the Occupational Safety and Health Act (OSHA) regulations located in the Code of Federal Regulations (CFR) administered by the U.S. Department of Labor, Occupational Safety and Health Administration (U.S. Department of Labor, Occupational Safety and Health Administration, 2011). In addition, OSHA mandates that all employers must provide a workplace where risks are identified and provide a workplace free of risks. This *catch-all* statement is located in the original Occupational Safety and Health Act put forth by Congress and is titled the

General Duty Clause, Section 503(b) (29 U.S.C. 654 Duties of employers and employees, 1970).

For development of a complete safety program in the medical field, the following questions must be addressed: do medical professionals/healthcare workers minimize the risks of their occupation; and are infectious occupational risks identified and mitigated when working with cadavers? If two of 785 donors had not previously been diagnosed with HIV and the program did not conduct serological testing, is this a risk that should be accepted or mitigated (Watkins, Haushalter, Bolender, Kaplan, & Kolesari, 1998)? However, it is important to understand the culture of the medical community. Physicians accept occupational risk because of the situations encountered in the day-to-day interface with potentially infectious patients.

Working with Bodies

Traditionally, embalmed cadavers are used for teaching gross anatomy in medical schools and anatomy and physiology classes for the life sciences. Embalming is the process whereby the cadaver has been profused with a chemical mixture called embalming fluid. According to Mercer (1992), the embalming fluid constituents that are most often used are formalin, ethanol, and phenol. Formalin is a 37% aqueous solution of formaldehyde gas (Mercer, 1992). The mixture is pumped throughout the body via the circulatory system and also placed in the abdominal cavity with a tool called a trocheur, so that all tissue is exposed to the embalming fluid. Each component of the mixture provides a different protection to the body, relative to decomposition. Ethanol prohibits mold growth and formaldehyde and phenols act as sterilizing agents to kill infectious

viral and bacterial vectors. Formaldehyde also fixes the tissue through modification of the protein structure to inhibit decomposition.

Using embalmed cadavers involve risks. Formaldehyde is a listed carcinogen (Mercer, 1992) and has air exposure limits that can often require laboratory ventilation design methods to ensure that the emissions from the cadaver are below the limits. Air exposure limits are exceedingly low in regard to formaldehyde emissions and may fluctuate depending on how long it has been since the body was embalmed and if the chest cavity is opened, as it holds more fluids.

Although embalming allows a greater time to study gross anatomy, other benefits are achieved when using unembalmed cadavers for clinical training and forensic research purposes. Clinical training with unembalmed bodies allows medical professionals to practice on tissue that is the most similar to live human tissue. Medical procedures, such as intubations and venous cut-downs, can be practiced on an unembalmed cadaver to increase medical knowledge and skill competency. The tactile feel of the body is needed for these procedures, so unembalmed bodies, instead of embalmed cadavers, are needed for this purpose.

Forensic anthropological research allows estimation of decomposition rates of humans in various configurations. The research is important to develop the science on how to identify the bodies within the decomposition state, estimate time of death, and identify the way the person died. Both practices are vitally important to the healthcare field, as well as to public safety and military operations; unembalmed bodies, or the newly dead need to be used for these purposes.

Infected, Diseased Donors

In a study conducted in 1998, researchers at the Medical College of Wisconsin (MCW) reviewed blood test data from a five-year donor pool for infectious diseases (Watkins et al., 1998). Of the 785 donors, 18 had an infectious disease that was not disclosed prior to the donation. Of these 18 donors, two were infected with HIV, six with the hepatitis B virus (HBV), and 10 with the hepatitis C virus (HCV). Within this study, Watkins, Haushalter, Bolender, Kaplan and Kolesari (1998) reported that in 1998, the researchers were unaware of any protocol mandating serological testing of donors to be used in medical schools or research, except at MCW. The medical files for the donor cadavers which tested positive for these diseases were reviewed in an attempt to discover if anything would predict or identify those that had tested positive for infectious diseases. No commonalities were found between the medical records. Amazingly, the donors who had been infected with HIV had an average age of 70.5 years, were female, and had not been diagnosed (Watkins et al., 1998).

These findings were supported by Bonds, Gaido, Woods, Cohn, and Wilson (2003) who conducted a study to determine the discrepancy rate for infectious diseases at an urban hospital over a six-year period. The study used autopsy reports and correlated these reports to clinical data for each patient. Out of the 182 patients, 137 (75.3%) had at least one infectious disease, 59 (43.1%) of these individuals had infectious diseases unknown before autopsy. Most were invasive fungal infections, which are on an increasing rise in correlation to the rise in HIV infections (Bonds, Gaido, Woods, Cohn, & Wilson, 2003).

Roosen, Frans, Wilmer, Knockaert, and Bobbaers (2000) found similar results. In a study conducted in 1996, 100 patients' clinical diagnoses and autopsy results were compared. The study was completed to demonstrate that the practice of autopsy remains an important medical educational tool and provides quality control to the medical community. In this study, 81% of clinical diagnoses were confirmed. Sixteen percent were found to have a major diagnosis that, if known, would have modified the treatment course, potentially leading to prolonged survival. From the initial study group of 100, one case of hepatitis and two cases of tuberculosis were identified on autopsy, but not clinically diagnosed. Sixteen patients were misdiagnosed due to fungal infections and other viral agents that allow opportunistic infections of the body. Roosen, et al. (2000) concluded that the number of missed diagnoses remains high and that the rate has not changed in the past 30 years. In addition, Wilson (2006) in his review of infectious disease and autopsy, estimated 20-30% of patients who die in hospitals have important diseases/lesions that are undetected before death.

Exposure of diseased cadavers could also occur because of misinformation. Pritt, Hardin, Richmond, and Shapiro (2005) conducted a study to determine frequency and types of errors on death certificates. The death certificate provides information to the families on the reason of death, but is mostly used for end of life legal matters. The death certifications are also used epidemiologically for public health data and for donation of cadavers to institutions. Donation programs use death certificates as a part of the evidence that the cadaver is suitable for acceptance of the donation.

The Pritt et al. (2005) study consisted of 50 patients where an autopsy was not conducted. This study included the review of medical record in comparison to the death

certificate. The study revealed that 48 certificates contained some degree of error. Major error rates ranged from 24-37%. Thirty-four of the errors were major enough that the death certificate had to be rewritten. Twenty-six percent of the death certificates did not have an acceptable underlying cause of death listed and 8% had the wrong cause of death (Pritt, Hardin, Richmond, & Shapiro, 2005).

Pritt et al. (2005) suggested that an annual course in death certificate preparation be completed by physicians who are familiar with the patient and their medical history. They also suggested that death certificates should be under review and physicians should be given feedback to improve the process. This study was complemented by Roulson, Benbow, and Hasleton (2005) who found that 33% of death certificates are likely to be incorrect and that 50% of autopsies produce findings unsuspected by death. Roulson et al. (2005) claimed that the discrepancy rates in death certificates have remained the same since 1960.

Given that there are numerous cases of either misdiagnosis, lack of diagnosis of a communicable disease, or errors on the death certificate, has exposure resulted in infection of healthcare workers or researchers? Nolte, Taylor and Richmond (2002) reported that pathologists have died of streptococcal sepsis after sustaining minor cutaneous injuries during autopsies on persons with a communicable disease. The transfer of tuberculosis, blastomycosis, AIDs, HBV, HCV, rabies tularemia, or diphtheria, to pathologists from a cadaver has also been documented (Demiryurek, Bayramoglu, & Ustacelebi, 2002; Gershon, Vlahov, Farzadegan, & Alter, 1995; Hardin, 2000; Stratton, 1995). Nolte and Yoon (2003) provided a theoretical risk of occupational bloodborne infections in forensic pathologists. At 250 autopsies per year and 30 career years, a

forensic pathologist typically conducts approximately 7500 autopsies per career. With a seroconversion rate of 5.6% for HIV and 19.1% for HCV and an injury rate of a cut in one out of 53 autopsies, Nolte and Yoon (2003) estimated a forensic pathologist not wearing cut-resistant gloves has a career risk of 2.4% for acquiring occupational HIV and a 39% risk for developing HCV.

The Centers for Disease Control (CDC) Agency for Toxic Substances and Disease Registry (ATSDR) defines the route of exposure as the way people come into contact with a hazardous substance (i.e., the infectious agent) (Agency for Toxic Substances and Disease Registry, 2009). The three main routes recognized by the CDC are: breathing (inhalation), eating or drinking (ingestion), or contact with the skin (dermal contact). The CDC also considers injection and splashes to the eye as possible routes of exposure to an infectious agent. To limit infectious agents from spreading to new hosts, the routes of exposure are assessed in order to mitigate contact by the use of personal protective equipment or administrative controls (e.g., procedures).

The main route of exposure through inhalation is by producing infectious aerosols from the cadaver's bodily fluids. Aerosols produced in the 1-5 micrometers diameter range become suspended in air (Nolte et al., 2002). This size of particle surpasses all bodily defenses and can reach the pulmonary alveoli of the lung. Aerosols are generated by venting fluids rapidly into sinks, oscillating saws applied to bone and soft tissue, and through water sprayed from hoses onto tissue surfaces. Dissecting the lungs of a cadaver can produce infectious aerosols (Nolte et al., 2002). Aerosols are not only generated from liquids. Concentration of respirable bone dust, up to 5700 particles per milliliter of air, have been measured in the breathing zone of autopsy workers using oscillating saws.

The biggest concern with aerosol production is mycobacterium tuberculosis exposure and inoculations, but could also potentially transmit rabies, plagues, legionellosis, rickettsioses (i.e., Q-fever) and anthrax. Nolte et al. (2002) referenced Meade (1948) and Morris (1946), showing that historically a large portion of medical students became tuberculin skin test positive after the autopsy training of their curriculum, indicating that exposure can occur during the student's educational period.

In regard to dermal contact, Paul and Jacob (2006) cited a chicken pox outbreak that occurred after an autopsy where the source was traced back to a cadaver. The individual died of probable disseminated varicella-zoster virus that was not diagnosed before death. As the diagnosis was unknown at the time of autopsy, a pathologist, two attending physicians, and 19 third-year medical students witnessed the autopsy. During the autopsy a blood splash occurred from the liver onto the unbroken skin of one of the medical students who was wearing limited personal protective equipment. Although the student was immediately decontaminated, 12 days later, four of the students exhibited symptoms for chicken pox.

Nolte et al. (2002) also reported that autopsies conducted on those infected with viral hemorrhagic fevers, such as the Ebola and Marburg viruses, can infect a pathologist through contact of infected bodily fluids by injection or a cut. The only viral hemorrhagic fever that is an exception is Hantavirus. Hantavirus does not spread from cadaver to living host and is not viable in the cadaver after death.

Special Areas of Concern - Prions

Prions are infectious small proteinaceous particles, which have been shown to cause chronic infection of the central nervous system (Mercer, 1992; Nolte et al., 2002).

Prions are a special concern as they cause several forms of spongiform encephalopathy; the most common is Creutzfeldt-Jakob disease (CJD). Prions can be found in human cadaver central nervous tissue and its coverings, mostly concentrated in the brain of humans who have Alzheimer's disease or dementia. Prions are not inactivated by formaldehyde or formalin and must be inactivated or sterilized with phenol. The route of exposure for prions is through an infectious aerosol, similar to tuberculosis. The particle size must be small enough to reach the pulmonary alveoli around 1-5 micrometers. This particle size can be achieved through aerosols generated by venting fluids to sinks, by water spraying by hoses onto tissue surfaces, and through the use of oscillating saws applied to bone and soft tissue (Nolte et al., 2002). Two cases of CJD have been documented in histology technicians working in two different neuropathology laboratories (Sitwell, Lach, Atack, Atack, & Izukawa, 1988; Miller D., 1988).

Mitigation through Universal Precautions

It is generally acknowledged that all unembalmed bodies should be deemed infectious and those working on or exposed to the body and bodily fluids should follow universal precautions (Demiryurek et al., 2002; Cahill & Freeland, 1992; Hardin, 2000; Watkins et al., 1998). Universal Precautions is a concept defined in the Bloodborne Pathogen standard regulations put forth by OSHA (U.S. Department of Labor, Occupational Safety and Health Administration, 2011) to force workers to become cautious while dealing with bodily fluids and Other Potentially Infectious Materials (OPIM). OPIM is defined as:

- The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in

- dental procedures; any body fluid that is visibly contaminated with blood; and all body fluids in situations where it is difficult or impossible to differentiate between body fluids;
- Any unfixated tissue or organ (other than intact skin) from a human (living or dead); and
 - HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV (U.S. Department of Labor, Occupational Safety and Health Administration, 2011).

As such, the definition of OPIM suggests that unembalmed cadavers should be treated as potentially infectious. Does the current practice of sanitizing the body prior to the clinical training class allow the clinician to negate universal precautions? Does the same apply to handling of the body for forensic research? Are the bodies sanitized before being laid out in the particular configuration that has warranted study?

The OSHA Bloodborne Pathogen Standard (U.S. Department of Labor, Occupational Safety and Health Administration, 2011) also discusses Universal Precautions. Universal Precautions is an approach to infection control as described by OSHA and the CDC. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens (U.S. Department of Labor, Occupational Safety and Health Administration, 2011). Bloodborne pathogens are defined in the standard as pathogenic microorganisms that are present in human blood and can cause disease in

humans. (U.S. Department of Labor, Occupational Safety and Health Administration, 2011).

To protect employees from infectious materials, the OSHA regulations propose three controls to reduce the likelihood of contacting the infectious agent; engineering controls, personal protective equipment, and workplace controls. Engineering controls are controls that isolate or remove the bloodborne pathogen hazard from the workplace. An example of an engineering control would be sanitizing the bodies to kill all infectious agents before use. Personal protective equipment is specialized clothing or equipment worn by an employee for protection against a hazard (U.S. Department of Labor, Occupational Safety and Health Administration, 2011). In regard to infection control, personal protective equipment includes the use of gloves, masks, face shields, laboratory coats and respirators to protect the employee from coming into contact with bodily fluids or aerosols generated during the procedure. Workplace or administrative controls include policies and procedures which are written to protect the employee from conducting research or training where workers would be exposed to infectious agents. The donation program with serological testing and review of the donor's medical records could be considered an administrative control. Training on proper handling of bodily fluids and the risks of bloodborne pathogens is also an administrative control.

Best Practices

Wayne State University (WSU) provides an example of using universal precautions when handling human cadavers in their institutional biomechanical testing laboratory program. Institutional officials at WSU screen cadavers before accepting donations, follow the CDC infection control guidelines, and sanitize after clinical or

medical procedures using appropriate infection control methods (Cavanaugh & King, 1990). WSU programmatic officials screen donors through serological testing of cadavers for HIV and HBV, through a physical exam looking for anything of concern such as needle tracks (e.g., representative of a past drug user), sores, diseases indicative of HIV, weight (i.e., the body has to be manageable), and occasionally through medical records. Medical records are seldom used, as they have proven to be too time consuming to obtain from the donor's physician. However, the physician is contacted if anything on the death certificate arouses suspicions (Cavanaugh & King, 1990).

Personal protective equipment is worn while handling the cadavers at WSU. This equipment includes full body coveralls or gowns, waterproof aprons, shoe coverings, and double gloves. All protective clothing is removed (or doffed) before exiting the area where the cadaver is located (i.e., the contaminated area). The clothing is removed in a specific manner to minimize contamination from the PPE. Procedures involving the generation of aerosols, usually when bone sawing and drilling, require more encompassing personal protective equipment. Molded surgical masks, goggles, surgical caps, and full face shields are used to prevent splashing of bodily fluids. The bone saw is outfitted with a striker vacuum to minimize the generation of bone dust. To prevent punctures or cuts while using needles, scalpels, or saws, metal mesh or Kevlar gloves are used (Cavanaugh & King, 1990).

Workplace controls include training to not recap or bend needles. Training is also required on bloodborne pathogens with the recommendation for all workers to get an HBV vaccination or titer to indicate immunity to HBV (Cavanaugh & King, 1990). Other programs, depending on the state laws for donation/cadaver programs, also include

rules on not utilizing unclaimed bodies in an unembalmed state (Cahill & Freeland, 1992).

Summary

This chapter has used studies and articles on legal, ethical, and safety issues, in order to describe how institutional officials perceive and mitigate issues, in regard to using the newly dead. The key legal issues to be studied are whether the body is property and is treated as such, the donation process, and the rights of the dead, including confidentiality and dignity of the donor. Key ethical issues to be studied include the time of death and informed consent. For safety, infection control is a key component to the study. This includes how infectious agents and their inherent risks are recognized and mitigated for worker safety.

These three foundations, law, ethics, and safety, are critical to implementing programs that allow transference of medical and forensic knowledge and growth in skill competency, while protecting the donor's gift, the workforce, and the institution's interest. The balance is critical in order to achieve these desired results. This study is needed to understand how this balance is achieved. This research will function as a foundation for other institutional officials building similar programs to ensure that due diligence has been conducted while achieving this balance.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to explore how institutional officials perceive the safety, legal, and ethical liabilities regarding the use of the newly dead in clinical training programs or forensic anthropological research use and how these liabilities are mitigated.

The following research questions guided this study:

- 1) How do institutional officials perceive liabilities in regard to potentially ethically or politically charged research and education endeavors?
- 2) What safety and health considerations need to be addressed when allowing anthropological research and/or clinical training on the newly dead?
- 3) What ethical issues and legal considerations are of concern when using the newly dead and what programs and/or processes are put in place to understand and mitigate these issues?

To address these questions, a multiple case study was conducted that consisted of analyzing interviews and documents that related to understanding and minimizing safety, ethical, and legal issues and liabilities in working with the newly dead. Interview questions and field notes of observations were used. The methodology employed to answer the research questions are presented in this section. This chapter is organized into seven sections (a) introduction, (b) research design, (c) the cases, (d) participants, (e) instrumentation, (f) data collection, and (g) data analysis.

Research Design

This research involved a descriptive multiple case study design, using a cross-case analysis between safety, ethical, and legal issues at an anthropological research facility (i.e. body farm) and at a university where clinical training on the newly dead is conducted. Within the Sage Encyclopedia of Qualitative Research Methods (Givens, 2008), case study design is defined as a research approach in which one or a few instances of a phenomenon are studied in-depth. Hammersley and Gomm (2000) further described case study as a research design that, usually, uses only a small number of cases, where the study is driven by actions of the researchers and where the primary concern is not controlling variables to measure effects, rather understanding what is occurring in a natural setting. Thus, quantification of data is not a priority and qualitative data may be treated as superior (Hammersely & Gomm, 2000).

How is a case defined and why was case study methodology used? Smith and Stake (1978; 2005) defined a case as a system that is bounded by what is happening within the case and deemed important. Stake (2000) clarified that a case does not need to be a person, but can be whatever bounded system is of interest. Within this bounded system, a case study can be used to identify issues that need to be studied along with drawing attention to problems and concerns (Stake, 1995). Hammersley and Gomm (2000) stated that the aim of a case study is to capture cases in their uniqueness rather than use them as a basis for wider generalization; the case study methodology is employed to identify a specific form of inquiry. Furthermore, case studies focus on specific mechanisms and pathways between cause and effect (Givens, 2008), making case study methodology a logical choice for researching programs that involve complex,

often controversial activities, such as the programs that served as the two cases for this study.

The Cases

Two institutional programs were chosen for this multiple case study. The purpose of this selection was to explore two settings where unembalmed bodies are being used. One institutional program represented clinical training, the other primarily for forensic research. Together, these two cases provided an understanding of the breadth of uses of the newly dead.

University of Maryland, Baltimore and State of Maryland Anatomy Board

For the clinical training on unembalmed bodies, interviews and tours were conducted and documentation was collected from institutional administrators at the University of Maryland, Baltimore and the State of Maryland Anatomy Board. This institutional selection was made as the University of Maryland, Baltimore clinical training program has been in operation for longer than ten years and has had input from regulators, stakeholders, and training participants.

The University of Maryland, Baltimore (UMB) is a public academic health and law university located in downtown Baltimore, Maryland. Established as the College of Medicine in 1807, UMB is considered the founding campus of the twelve campuses that comprise the University System of Maryland (University of Maryland System, 2011). UMB is composed of a 61-acre research and technology complex, specializing in medical, dental, law, pharmacy, nursing and social work education; it is considered a major biomedical research institution (University of Maryland, Baltimore, 2011). An additional 10-acre plot includes the University of Maryland BioPark, providing an

additional 460,000 square feet of wet lab (i.e., a laboratory which requires direct ventilation and piped utilities) and the State of Maryland Forensic Medical Center. UMB's sponsored research for fiscal year 2010 equaled approximately \$567 million dollars. That same year, the campus population included 6,349 students along with 6,717 faculty and staff (University of Maryland, Baltimore, 2010).

To alleviate confusion, UMB uses the name *University of Maryland* when describing the institution. This is also true of the University of Maryland, College Park. For those in Maryland, there is little confusion to the shared name as the University of Maryland, College Park has largely research-oriented graduate programs and does not offer many professional school opportunities. In addition, UMB does not have college sports and offers primarily graduate classes with some undergraduate classes in nursing, dental hygiene, medical technology, physical therapy, and social work. By law and tradition, each institution is entitled to use the "University of Maryland" name in recognition of their shared history. Although the institutions can share the name and are both institutions within the University System of Maryland, neither is a part of the other. To further separate this institution from other University System of Maryland institutions, UMB is not the University of Maryland, Baltimore County located in Catonsville, outside of Baltimore; nor it is the University of Baltimore, a liberal arts college located in Baltimore.

The medical school at UMB was the first public medical college and the fifth oldest medical school in the United States (University of Maryland, Baltimore, School of Medicine, 2011b). In addition, UMB was the first public medical school to include a residency program. The UMB School of Medicine ranks 18th in all medical schools,

sixth in public medical schools in the United States, and generated \$479 million in sponsored research in 2010 (University of Maryland, Baltimore, School of Medicine, 2011a).

The anatomical program is associated with the UMB School of Medicine, but is actually administered by the State of Maryland Anatomy Board. The Anatomy Board is a state-government office reporting to the Department of Health and Mental Hygiene (State of Maryland Department of Health and Mental Hygiene, 2004). By Maryland law, Section 5-406 Unclaimed Bodies, all unclaimed bodies become exclusive control of the Anatomy Board for preparation for burial, or research or training purposes (State of Maryland, n.d.). All donated bodies for medical research and training in the University System of Maryland also are directed to the State of Maryland Anatomy Board before being issued to the institutions. Approximately 1,500 bodies are donated per year, of which 300 are used in the medical schools for dissection (Block, 2005). The rest are used for medical training of paramedics, doctors, and nurses. The State Anatomy Board conducts all clinical training. Bodies are cremated after dissection/training, a memorial service is conducted, and the cremains are interred in a cemetery in Sykesville, Maryland. The ashes can be returned to the family, if requested (State of Maryland Department of Health and Mental Hygiene, 2004).

Texas State University-San Marcos, Forensic Anthropology Center

Texas State University-San Marcos, Anthropology Department institutional programs were reviewed for the forensic anthropological research section of this study. For the forensic anthropological research facility, the Texas State University-San Marcos program was chosen, as the Forensic Anthropological Center at Texas State (FACTS)

was opened, including the Forensic Anthropological Research Facility (FARF) in 2006. As FARF, the body farm/decomposition facility, was opened recently, current regulatory statutes had to be followed to initiate building and operation of the facility.

Texas State University was authorized by the Texas legislature in 1899 and opened in 1903 as the Texas Normal School located in San Marcos, Texas (Texas State University-San Marcos, n.d.c). Historically, the school's mission was to be a small teacher preparatory school, providing teachers for the state of Texas. As the school population grew and the curriculum became multipurpose, the name was changed to Southwest Texas State. In 2003, the institution was renamed Texas State University-San Marcos (Texas State). Currently, the institution offers 200 undergraduate and post graduate degrees from classes located in one of the 225 buildings on a 457-acre campus. The town of San Marcos, Texas is located between San Antonio and Austin. San Marcos has a population of 50,000 residents along with the Texas State University student population of 32,572 (Texas State University-San Marcos, 2010).

Texas State offers a masters degree program in forensic anthropology, which includes educational opportunities and research at the FARF which is administered by the Department of Anthropology. The FARF is a 26-acre outdoor human decomposition research lab located at Texas State University Freeman Ranch (Texas State University-San Marcos, n.d.b). The FARF is a decomposition facility where cadavers are laid out in various configurations in order to analyze the human decomposition process. Reconstructing backwards from decomposition to time of death is crucial for legal investigations and the research is needed for state and national law enforcement agencies.

In addition to studying the decomposition process, educational training classes are held for law enforcement agencies.

Bodies are donated specifically to be used at the FARF (Texas State University-San Marcos, n.d.a). Interested donors fill out application forms that clearly state that the remains will not be returned to the family. The forms also indicate that the body to be donated will be used for restructuring the postmortem interval to determine time since death and related studies in human decomposition (Texas State University-San Marcos Forensic Anthropology Center, n.d.).

Participants

At UMB, the State of Maryland Anatomical Board Director was interviewed, along with the UMB Assistant Director for Environmental Health and Safety. This included: Mr. Ronn Wade, Anatomy Board Director and Steven Deck, UMB EH&S Assistant Director. The Director of the State of Maryland Anatomy Board and his staff handle the cadavers for all of the University System of Maryland. All clinical training is conducted under the purview of the Director of the Anatomy Board. The Office of the Anatomy Board also administers the body donation program and all public relations concerning cadaver use in the State of Maryland. The UMB EH&S Assistant Director consults with the Anatomy Board Director to ensure public health safety measures are used and that trainings are conducted to understand and mitigate the risk of infectious disease.

At Texas State, the Director of the FACTS and the faculty were interviewed along with Texas State environmental, health and safety personnel. This included: Dr. Daniel Wescott, FACTS Director and Associate Professor of Anthropology; Dr. Michelle

Hamilton, FACTS Faculty and Assistant Professor of Anthropology; Dr. Kate Spradley, FACTS Faculty and Assistant Professor of Anthropology; and Ms. Elsie Romano, EH&S Laboratory Safety and Biosafety Specialist. As the Director had only been at Texas State for 6 months, the Director only had direct knowledge about how facility operates. The department faculty, who previously were co-directors of the facility, had information on how the facility was constructed and how accepted the decomposition facility is within the community. The department faculty were also interviewed in order to gather information on how donations are accepted, what testing is completed on the cadavers, and how the facility personnel interact with the families of the donors. Environmental health and safety personnel provided information on what training is needed for the decomposition and processing facilities, and what personal protective equipment must be worn while working with the cadavers.

Instrumentation

Instrumentation for this study included: semi-structured open-ended interviews with participants from the two institutions; document analysis; and field notes of the location. As described by Merriam (2009), semi-structured interviews are interviews that evolve from inquiry composed of a mix of more or less structured unstructured questions. Questions were structured to allow the participants the perception of assisting another institution with implementing a similar program. Through relaying this purpose, the participants responded frankly about the positive and negative aspects of their established programs.

Interviews

A short list of issue-oriented questions was developed and correlated to the research questions to allow the respondents to reflect on the topics of ethics, safety, and legal issues of working with the newly dead (Appendices A and B). The interview questions found in Appendix A were used for clinical training. The interview questions found in Appendix B were used for forensic anthropological research. Questions concerning the body donation program, the ethics of donation, the preparation of the body and the testing for infectious disease were asked. The subjects of community relations and public acceptance of donation, training, and research were explored. Questions were asked on what personal protective equipment is needed for which training courses, how the safety officer interacts with regulatory officials, and other liabilities not specifically addressed, such as sewer discharge permits of bodily fluids and other regulatory items that would constitute institutional liability if not mitigated.

Progressive focusing (Stake, 1995) was used when new issues became apparent and additional questions were asked to focus on the issue. Some probing questions were used to further articulate the answer to the question. All interviews were conducted using an audiotape format and transcribed verbatim. Follow-up questions were made by phone and e-mail to clarify understanding of the program in relation to the research questions.

Documents

Document analysis included reviewing donation program material including: informed consent forms, death certificates, and procedures on accepting donations. Other documents that were analyzed included: procedures on how cadavers are placed in the

field and how remains are skeletonized. It was noted that the State of Maryland Anatomy Board did not have any procedures for the processes that occurred at their facilities.

Field Notes

Participant/Observer observations were made in the field at each of the two institutions. Field notes were taken when observations were made. Observations were first gathered by observing as an *outsider* and then by moving into the setting and observing as an *insider* (Creswell, 2007). A general tour of the area or institution was conducted at the beginning of the week for orientation, followed by a detailed tour, as programmatic intricacies were discussed.

Data Collection

Within the Sage Encyclopedia of Qualitative Research Methods (Givens, 2008), the challenge of a case study is collecting empirical evidence to answer the research question. Yin (2003) recommended using multiple sources, connecting the answers to the questions through the data collection to the conclusions of the study. To satisfy these issues, data was collected from multiple sources of information, including the semi-structured interview data, documents, and observations.

Questions were formulated from the definition of the case, list of research questions and potential data sources. Stake (1995) posited that the three stages of data collection are observation, renewed inquiry, and explanation. Issues emerged that were dominant, but were considered within the data collection phase. As such, progressive focusing was used when these new issues become apparent and additional questions were asked to focus on the issue. As case studies are narrative, all observations were directed by the issue and the physical situation was well described.

Before data collection began, contact was made with all potential respondents and/or participants by email or letter. Written consent to collect data was obtained by the appropriate officer/administrator of each institution. Approval was also granted through the University of Nevada, Reno Institutional Review Board before the research was started (see Appendix C). Information sheets were used in lieu of signed consent.

The week of January 23, 2012, interviews were conducted with the State of Maryland Anatomy Board Director, the Board staff, and the UMB Assistant Director for EH&S. This included: Mr. Ronn Wade, Anatomy Board Director and Steven Deck, UMB EH&S Assistant Director. Interviews were conducted with each participant in their respective offices. The interview with Mr. Deck was approximately one hour in length. The interview with Mr. Wade was approximately two hours. A general tour of campus was conducted on January 23, 2012 with site-specific tours occurring January 24 – 27, 2012. The donor registration form and death certificates were reviewed as part of the interview with the Anatomy Board Director. No procedures were available for the processes that occurred within the facility. The Anatomy Board Director provided a presentation to explain the Board's function and Maryland State Law pertaining to the Board.

The week of January 30, 2012, interviews were conducted with the Texas State FACTS Director, Anthropology faculty researchers who had prior authority of the FACTS facilities, and the Environmental Health and Safety Biosafety Specialist. This included: Dr. Daniel Wescott, FACTS Director and Associate Professor of Anthropology; Dr. Michelle Hamilton, FACTS Faculty and Assistant Professor of Anthropology; Dr. Kate Spradley, FACTS Faculty and Assistant Professor of Anthropology; and Ms. Elsie

Romano, EH&S Laboratory Safety and Biosafety Specialist. Interviews were conducted with each participant in their respective offices. Interviews were approximately 60 to 90 minutes in length. A general tour of campus was conducted on January 30, 2012, with a site-specific tour of the Grady Early Forensic Anthropological Research Laboratory occurring on the same day. Site-specific tours of the FARF and the Osteological Research and Processing Laboratory were conducted on February 1, 2012. During the interviews, documents needed for the analysis were identified. Procedures (Stull, 2010a; Stull, 2010b; Stull, 2010c; 2011) were provided on the donation process, the body placement process, and the skeletonization of remains and an organization chart was provided by the EH&S office.

During the interviews, additional documents were identified. Extensive field notes were taken during and immediately after the tours. Interviews were audio recorded and transcribed verbatim.

Data Analysis

Stake (1995) described data analysis a matter of giving meaning to first impressions, as well as final compilations. Through interpretations and aggregation of instances, the analysis should reach new meaning (Stake, 1995). Analysis was conducted to make naturalistic generalizations, arrived at through personal engagement or vicarious experience with the data. Good raw data and narrative allowed construction of knowledge and allowed generalization of situations.

Data from the interviews, document analysis, and field notes were analyzed for similarities and differences in how these institutions dealt with the ethical, safety, and legal issues of working with the newly dead. A constructivist approach for data analysis

was used, identifying emerging themes within the data, along with pattern-checking within the cross-case analysis design. The themes were used to identify common thought processes and actions of the participant pool. Field notes were reviewed for how activities are influenced by contexts. These contexts are described as they influence the activities, even if evidence of the context is not found (Stake, 2005). These contexts - social, cultural, situational, and political, all relate to the frames of organizational theory, as presented by Bolman and Deal (2008), the theoretical framework of this study.

According to Best and Kahn (2005), subjective bias is a constant threat to gathering and analyzing data. Through good interpretation of observations, document reviews, and good interview questions, effects that may be wrongly attributed to any research question will be minimized. As described by Stake (2005), triangulation occurred by validating data through cross-case analysis of the two institutions and multiple data sources, through investigator or theory triangulation, and by member-checking, as recommended by Stake (1995). Review of records followed direct observations to increase methodological validity. The descriptions of each case were submitted to the key participants for their review to ensure accuracy.

For this study, analysis for each location was completed separately, as the use of cadavers differed between clinical training programs and forensic research. Documents from each location were analyzed first, as programmatic documents described the program in a formal manner. Interview transcriptions and field notes were analyzed after document analysis, to incorporate the day-to-day operations and to answer questions that may not be indicative in programmatic documents. Discrepancies, gaps, and information of what is important were noted. After analyzing each location separately, the

information gathered from the data analysis was juxtaposed against the other to indicate other gaps or similarities in programs.

Analysis also included relating all data back to the three components; legal, ethics, and safety, to identify common themes between clinical training and forensic research to thoroughly answer the research questions. This analysis was needed to understand the totality of the requirements in order to initiate similar programs at other institutions.

Further analysis was conducted using the frames as authored by Bolman and Deal (2008). With the emphasis on accountability in administration of programs in education and with the need to ensure the health and safety of the institutional workforce, organizational theory was considered to be vital in regard to implementation of institutional programs that mitigate liability. Thus, the data was characterized within two of the four frames, specifically the political and symbolic frames. By categorizing the data within these two critical frames and analyzing for the strengths and weaknesses of each frame, it was possible to understand the data from a theoretical perspective. By conducting this analysis, institutional officials who implement similar programs may understand the organizational context and theory integrated in each program.

Summary

This chapter restated that the purpose of this research is to fill a gap in the literature on how institutional officials satisfy ethical, legal, and safety concerns when working with the newly dead on clinical training and forensic research. The participants for the multiple case study were chosen through purposive sampling of an institution that has implemented using the newly dead for clinical training and an institution that

administers a forensic research anthropological facility. Triangulation of all data was implemented through cross-case analysis, pattern-checking, data triangulation through gathering multiple data sources, and member-checking by having the participants verify the transcript from their interview. Data collection occurred through semi-structured interviews, direct observations, and document analysis. Data analysis was conducted through analyzing similarities and differences in how these two institutions deal or have dealt with the ethical, safety, and legal issues of working with the newly dead within the interview data, document analysis, and field notes generated from observations. A constructivist approach for data analysis was used, pulling emerging themes within the data, along with pattern-checking within the cross-case analysis design. Results of the data analysis are presented in the following chapter.

CHAPTER IV

RESULTS

Introduction

The purpose of this study was to investigate how institutional officials perceive and mitigate safety, legal, and ethical liabilities in regard to working with the newly dead in clinical training and forensic anthropological research. Three research questions guided this study:

- 1) How do institutional officials perceive liabilities in regard to potentially ethically or politically charged research and education endeavors?
- 2) What safety and health considerations need to be addressed when allowing anthropological research and/or clinical training on the newly dead?
- 3) What ethical issues and legal considerations are of concern when using the newly dead and what programs and/or processes are put in place to understand and mitigate these issues?

To address these questions, a multiple case study research design was employed. Data were collected from two centers with distinct purposes. Data sources included interviews with key center personnel, documents, and observations. Data were analyzed according to the method described by Stake. This chapter is organized into five sections (a) introduction, (b) the cases, (c) identified themes, (d) the cross case analysis, and (e) summary.

The Cases

Clinical Training in Maryland

The adventure started in the City of Baltimore, where Edgar Allan Poe is buried. As such, it is appropriate to open this case with a quote from *The Raven*, “Let my heart be still a moment and this mystery explore” (Poe, 1845/2011, Kindle Location 261), thus commencing the journey to study the use of fresh cadavers in clinical training. Within this city, the modern yet historic campus of the University of Maryland, Baltimore (UMB) is located off the Inner Harbor where the Patapsco River flows into the Chesapeake Bay. Situated in the heart of Baltimore, the campus is made up of approximately 60 buildings which contain the professional schools of law, medicine, pharmacy, social work, and nursing. Within the campus are numerous Revolutionary War gravesites, including the older Westminster Burying Grounds, the famous cemetery that contains Edgar Allan Poe’s grave. Modern buildings are interspersed with older historical buildings such as Davidge Hall, built in 1812 to house the medical school which started in 1807. The focus of this case, however, is on the activities of the State of Maryland Anatomy Board that are conducted in the Bressler Research Building located in the middle of the UMB campus.

Journey of a Body

Bodies used for clinical training purposes are either donated to the State of Maryland or are unclaimed bodies that need disposition whereby state disposition is required. Regardless of their origin (donated or unclaimed), the journey of a body follows a similar path. When a person dies in the State of Maryland and the body is either unclaimed or donated to the State of Maryland, the body is taken to the basement of the

Bressler Research Building. Here the bodies, on busy mornings, line the hallways of the biohazardous area waiting for testing and identification. One reason for the abundance of bodies is that unclaimed bodies are kept for a 14-day minimum to ensure that if a family member is attempting to claim the body, there is time for the family to secure the resources for burial.

On arrival, the body can go one of three ways: (a) to the freezer to be held for immediate cremation; (b) to the Medical Examiner's office; or (c) to be flushed and/or embalmed. If the body is marked infectious, usually indicated by "HIV" or "Hep B" written on the body bag, the body is immediately boxed for cremation and put into the freezer to isolate it from the staff. If there are any suspicious circumstances of death noted on the body, then the body may be sent to the Medical Examiner's office, if an autopsy is ordered. If the body is not marked infectious or there are no suspicious circumstances, the bodies are readied for vascular disinfectant and/or embalming. It is this third group for which the journey continues.

All cadavers destined for use in clinical training or anatomical basic scientific study are given a body identification number related to their donation registration or unclaimed body paperwork. These numbers help track the cadaver from arrival at the facility, through use, to disposition of the body. The numbers are engraved onto a metal ear tag that is attached to the ear of the cadaver. The number is also written on the chest prior to flushing and/or embalming. When disarticulated, the cadaver number is also written on each body part or specimen for tracking purposes.

Prior to flushing and embalming, serological testing and examination of the death certificate has been completed to ascertain whether the bodies to be used for clinical

training or anatomical scientific study have unknown infectious disease. Serological testing involves using a 20cc syringe with a large gauge needle into the left ventricle of the heart to draw blood to test for HIV and Hepatitis B. The blood samples are taken to the Medical Examiner's office to be sent out for testing at the State Health Lab. If the blood serum result is positive, the body will not be used. The death certificate is also examined to identify the cause of death. Any cause of death that is questionable or includes infectious disease results in the body being placed in a box and put in the freezer to hold for immediate cremation.

After the blood draw is concluded, bodies with or without the serological testing results are flushed of bodily fluids (i.e., the blood) and treated with a disinfecting agent. The flushing of the body commences with the preparator undressing and inspecting the body. Any evidence of heavy drug use or extensive piercings results in placing the body into the freezer for immediate cremation. These bodies are assumed to be potentially infectious for hepatitis. The preparator places blocks under the body at the neck and hip to reduce pressure points that might restrict the flow of the disinfecting fluid throughout the body.

An incision is made on the right axillary brachial artery, as it is closer to the heart, to introduce the disinfecting wash. At the same time, an incision is made in the right femoral vein. An embalming pump is used to force the chemical concoction that includes "B4", a chemical disinfectant product made by the Hydrol Chemical Company, mixed with water into the body to flush out the vascular system. The objective of the disinfectant is to treat the body so as to reduce the risk of exposure to bodily fluids and hold off decomposition for 30 days. As such, the disinfectant contains only a small

amount of formaldehyde; the objective is not to desiccate and fix the tissue. The disinfectant does not contain any phenol either, as phenol coagulates the blood.

Three gallons of the disinfecting solution is pumped throughout the body, allowing the blood to exit the femoral vein along with excess fluid. During the site visit for this research, while the fluids were pumping through the body, it was visually noted that there was distension of the tissues. This distension was viewed as a positive aspect in the process, as it indicated that there were no embolisms or clots that were preventing the disinfectant wash from pushing the blood out of the body. After the fluids are pushed through the body, the two incisions are sewn up using a specially formulated 7-stranded string, called mortuary string. The body is then washed with a germicidal wash on the outside to ensure that it is clean. After flushing and washing the body, the body can be stored in the cooler for 30 days to be used for mortuary embalming training, clinical training, embalming for dissection, or plastination.

- Mortuary embalming classes are held in the facility by Catonsville Community College; class participants use full cadavers to learn the craft of embalming.
- Clinical training can involve using the disinfected fresh cadaver as a whole, as in training given for trauma surgeons who are conducting various operations on the cadaver, or the body may be disarticulated into specimens that are used in multiple trainings dependent on the body part.
- Embalming occurs on bodies prepared for dissection in anatomical basic science studies. Bodies designated for anatomical basic science include full cadaver anatomical specimens or may be disarticulated for specific trainings (e.g., dental gross anatomy).

- Bodies also can be disarticulated for preparing specimens using special anatomical preparation methods (i.e., plastination). Plastination is a process where polymers and acetone are used to make a permanent specimen for study as it holds off decomposition by removing all bodily fluids and water.

Anatomical embalming occurs only on bodies after they are treated with disinfecting agents. This Center utilizes a custom embalming fluid, which contains less formalin (the chemical that releases formaldehyde when used within the body) and more phenol in comparison to other embalming fluids. The custom embalming fluid results in less formaldehyde emissions when working over embalmed cadavers. The embalming process is similar to the disinfectant wash and uses the exact incisions that were used for the flushing process. Three gallons of embalming fluid are normally used, but professional judgment and knowledge dictate, as up to six gallons may be needed due to the cadaver size. Unclaimed bodies are generally embalmed and stored for eight months to a year before they are released for anatomical basic science study to ensure that the body will not be claimed. However, the timeframe for use of all bodies is at the discretion of the Anatomy Board Director.

Mr. Ronn Wade, Director of the Anatomy Board, indicated that 95-97% of all bodies that arrive at the facility are used. The general estimate is that 30% of these bodies are embalmed and used for anatomical basic science study, while 70% are treated and used for clinical training sessions. Disarticulation of the bodies is common to maximize use of all bodily parts and to increase the value of the body to medical teaching, research, and the acquisition of knowledge. In 2011, 1700 bodies went through the Board's facilities. It was estimated that four percent of the total bodies in 2011 were unclaimed.

There was a noticeable increase in the number of unclaimed bodies during the recent economic recession; the assumption was that many family members could not afford to bury their loved ones. Indeed, during the recession, the percentage of unclaimed bodies rose from about four percent up to ten percent (Woolf & Wade, 2012).

The Board's public health responsibilities (see below for more detail) allows acceptance of unclaimed bodies; whether or not the body is used for clinical training or research, the Board disposes of the bodies via cremation. After cremation, the cremains are buried within a common graveyard plot owned by the State of Maryland. As such, unlike most counties in the United States which are responsible for burying unclaimed bodies, this burial expense is shifted from the counties to the State of Maryland. This public health responsibility is critical in dealing with unclaimed bodies, especially from highly urbanized areas. Mr. Wade stated that during the recent economic downturn many counties, in other parts of the country, especially counties with large cities, had exhausted their funds to bury the unclaimed, resulting in what he called, "pack them and stack them" where bodies are frozen until funds can be identified or reallocated to care or the unclaimed dead.

The Anatomy Board and Staff

Nine states in the United States have State Anatomy Boards; Maryland is unique. Rather than simply being a policy-making authority, as in other states, the Maryland State Anatomy Board, referred to as the 'Board' hereinafter, acts as a receivership and a distributor of donated and unclaimed bodies. As such, no medical school has an individual body donation program; rather all bodies are received by the Board to be prepared and distributed to any program that requests a cadaver for use in study or

training. The Board also has a clinical training suite where clinical training classes are held under the authority of the Board in conjunction with the sponsoring clinician.

In essence, the Board functions as the purveyor and distributor of cadavers for all schools in Maryland that have the legal right or purpose to use a cadaver. One result of using donated and unclaimed bodies is that medical schools within Maryland do not suffer for lack of usable bodies for medical teaching, research, and knowledge. This includes both aspects of cadaver use – embalmed bodies for anatomical basic science teaching and research as well as unembalmed specimens for clinical training.

The Board's authority is defined through statute (Annotated Code of Maryland 5-406 is on Unclaimed Bodies, n.d.). In 1949, Maryland had two medical schools that needed bodies. Sanitariums were their primary source of the bodies; they were mostly the victims of tuberculosis. That year, the State of Maryland anatomy laws were modified to accomplish two purposes. The first was to establish the state Board, the purpose of which was to consolidate cadaver use for the medical teaching needs in Maryland. The second purpose was to establish a legal framework regarding unclaimed bodies. The law stipulates that anybody who dies and is to be buried at the public's expense falls under the jurisdiction of the Board. By changing the law, the target pool of bodies was widened to include unclaimed bodies (i.e., bodies to be buried at the public's expense)

The 1949 law also designated authority of the body donation programs to the Board. However, that provision of the law was not implemented until the mid-1970's. Even though the law had passed, in 1949 and thereafter, body donation programs for individual medical schools remained in place. Scientific personnel managed the

donations and preparation of bodies for medical teaching. In the mid-1970's, three things happened. The Board became a standalone entity, not affiliated with any one medical school. At that point, the consolidated willed body donation program was revamped, allowing the donor's ashes to be returned to the families, if requested; previously bodies were incinerated after use. In addition, the newly appointed Board Director hired experienced, licensed morticians, trained in handling cadavers in a decent and dignified manner, and who had extensive experience in the embalming arts.

The Board exists as a department within the State of Maryland Department of Health and Mental Hygiene. Oversight of the Board consists of two members from each medical school in Maryland (John Hopkins University, University of Maryland, Baltimore, and the Bethesda Naval Hospital), one member from the Dental School (University of Maryland, Baltimore), and the Director of the Board. These members are professors from various medical and dental disciplines and oversee the Board's operation. The Director operates and oversees the administrative and laboratory activities under the Board's authority. The law that enacted the Board grants the Director specific authority with broad discretion. New programs involving cadavers must be approved by the Director to receive the anatomical resources for teaching, training, or research from the Board.

The actual Board consists of the Director and a staff of less than a dozen people whose positions encompass administrative (e.g., accounting and donor form registrations) and preparators, who are responsible for preparing the cadavers for use. The preparators are all licensed morticians or embalmers. Their primary duties are to treat, disinfect, and embalm the bodies. One preparator is specifically assigned to disarticulate the bodies,

dependent on need. This same preparator specializes in anatomical specimen preparation and preservation methods (i.e., plastination, vascular casting, etc.) with latex or plastinate. In addition to the preparator and administrative functions, a clinical training coordinator schedules clinical training courses for clinicians and the clinical training facilities located within the Board's facilities and area of responsibilities.

The Board's administrative and laboratory operations are housed within the University of Maryland, School of Medicine's Anatomical Services Division on the UMB campus. These operations include a centralized anatomical-morgue facility that supports the statewide education, training, and research needs for medicine, trauma, surgery, and allied health professions. Operations also include performing unique and special anatomical preparation methods to enhance medical study and training. Facilities include an equipped surgical-anatomy practice laboratory to maximize teaching, training, and practice for clinicians, surgeons, and allied health professions to develop their skills, knowledge, and expertise for working on patients.

During the interviews, staff members were a lively, humorous group of people, which was noteworthy as they deal with the results of death every day. Members of the staff viewed themselves as having an active and purposeful role of advancing medical knowledge, while addressing a public health need. For instance, the clinical coordinator stated, "I'm on the forefront of medicine. When anyone asks me what I do, I tell them clinical research". The quote was in reference to military field surgeon clinical training courses that were completed within the Board's facilities before deployment of military surgeons. It was evident that the group was proud of what they do and they worked as a cohesive team to address the many bodies that arrive at the facility. In discussions with

some of the staff members, the only thing that “gets” them on the job is when they have to embalm babies.

The lively attitude and humor of the staff was emulated by Director Wade. Mr. Wade presented himself as a somewhat eccentric man, driving an older Lincoln Town Car with the license plate, “MUMMIES”. He has been the Board Director since 1973. Mr. Wade stated that since his youth, he always had a real appreciation of anatomy. In fact, Mr. Wade’s background is steeped within the funeral director/mortician industry, as his father was a mortician. “I always appreciated the human service that dad did with grieving families”, which appeared to have influenced Mr. Wade’s approach to grieving families. Further discussions with Mr. Wade led to the observation that although a renowned international expert in mummification and plastination, he views himself primarily as serving the constituency of the State of Maryland. In addition, he is furthering the development of medical knowledge, research, and teaching: “My interest is to promote medical education, clinical training, and research studies and act in the best interest, first and foremost, to the citizens of Maryland – the ones that are alive and breathing”. Entwined in this personal mantra is the belief that Mr. Wade and the Board serve a public safety function in dealing with dead bodies, “We serve the living by taking care of the dead” (Woolf & Wade, 2012).

Clinical Training Facilities

In addition to the preparing and embalming activities, the Board facilities also include a specialized clinical surgery suite that allows training classes to be scheduled on treated, unembalmed bodies. This suite has six training stations, but can accommodate up to 12 surgical tables, complete with surgical lights and special audio visual equipment

similar to a hospital operating room. Participants in past trainings have included, but are not limited to, paramedics, trauma surgeons, fire department EMTs, respiratory technicians, and military field surgeons. The clinical training area can also be used by individual surgeons to practice surgical techniques. Mr. Wade described this situation:

What I offer them is an opportunity, an environment, a forum, and a venue to come down and practice on their own. Any doctor can pick up the phone and call me and say, 'I've got a surgery scheduled next week and I haven't done it before.' They get priority to come down here, because it impacts upon the patient due for surgery, so they will get in the door immediately to practice on a specimen (Woolf & Wade, 2012).

There are two fees associated with clinical training courses. Both fees are paid by the training participants. The first fee is a cadaver use fee that is returned to the State of Maryland General Fund. The second fee is a surgical clinical training usage fee that goes to the Board to pay for the operating expenses and maintenance of this specialized training area.

Body Donation Program

Unlike many other willed-body donation programs, there is no cost for donating a body to science in the State of Maryland. No costs are charged to the donor family because it is considered a public health value; the Board pays all costs for transportation, preparation, and cremation. The Director estimated that it costs around \$700.00 - \$800.00 to prepare a cadaver for study. As part of a state agency, the Board receives a portion of its funding through the General Fund of the State of Maryland. Indeed, the cadaver use fee is an attempt to recoup the cadaver preparation costs to the State of

Maryland. Additional costs are covered through the clinical laboratory fee that remains with the Board. As indicated, both fees are paid by the participants of the training programs.

To donate, interested parties complete the paperwork and register their bodies pre-mortem with the Board. Upon death, the body is brought to the Board's facilities for preparation. If the body is found to be unsuitable and it is a donor, the body remains under the control of the Board. No costs are incurred to the family if the body has to be immediately cremated and therefore is not used in a study Mr. Wade explained: "We will honor the decedent's wishes as when someone is bereaved, the fact they have honored all of the wishes of the deceased is very supportive of the grief process". Ashes are returned, if requested, otherwise they are buried in a Sykesville, MD gravesite, owned by the state. As the Board holds around 70,000 donor registrations, the Board does not take donations after death. Donations are only accepted through pre-registration and signed by the individual donor (Woolf & Wade, 2012).

Education of the donors is done through public talks, publications on the donation process, and answering questions from the donors. Mr. Wade feels that the more information a donor receives, the more positive impact it will be on donations. However, there are limitations as to what donors are told. The potential uses of the body are not listed in any document. It is believed that when individuals donate their bodies; they have a commitment to science:

If they had an emotional investment in the body, if they said, 'don't touch mom's face', they wouldn't donate. Most people who donate their bodies predominately

the attitude is, 'That is not John, John is not here anymore, that is just what John used while he was here on earth. He is gone' (Woolf & Wade, 2012).

Throughout the interview, Mr. Wade was very clear that the body's use is at the Board's discretion.

Although a philosophy of empathy and compassion were expressed throughout all of the interviews, once the body reaches the Board's facilities, the body is under the control of the Board. The staff views that they have control of a donated body immediately upon the donor's death. When an unclaimed body is brought to the facility, 14 days is allowed for the body to be claimed, although the law states that control of that body shifts to the Board within 72 hours. This control, or quasi-property right, allows decisions to be made concerning the purpose and use of the body without input from the family or next-of-kin.

Safety Oversight

Although the Board manages the program operations, it is reliant upon UMB for its facilities. As with all universities where research is conducted, UMB has an Environmental Health and Safety (EH&S) office staffed by safety professionals. The relationship between the Board and the EH&S office is somewhat complicated because of reporting lines. As indicated, the Board is under the umbrella of the Maryland Department of Health and Mental Hygiene; therefore has a reporting line to the Governor. The EH&S staff is a compliance office of the UMB. The Board staff conduct all of the cadaver preparatory work within UMB facilities, which are monitored by the EH&S office. As such, the Board must follow all policies and procedures that are

designated by UMB for space allocation and use. These policies include the environmental, health, and safety programs overseen by the UMB EH&S office.

The UMB EH&S office consists of approximately 25 staff members located in their own historic facility located on Lombard Street, about a block away from the clinical training facilities. EH&S services to the Board include, but are not limited to, the management and disposition of biohazardous waste, bloodborne pathogen program and training, and formaldehyde emission exposure testing. Safety programs are in place and a relationship between the two entities exists, although the Board employees are not true employees of UMB (Woolf & Deck, 2012).

Steven Deck has worked at UMB for 18 years. Within these 18 years of experience at UMB, Mr. Deck has been involved in implementing most types of EH&S programs, and is currently serving as the Assistant Director of EH&S. Mr. Deck spoke fluently on the requirements needed or prescribed for the Board operations. These programs included:

- Bloodborne pathogen exposure control plan
- Formaldehyde exposure monitoring
- Proper selection and use of PPE
- Fire and life safety program
- Hazardous Materials Disposal.

EH&S has worked actively with the Board to ensure compliance with regulations and to assist in implementation of the culture of the use and compliance regarding Universal Precautions.

Although all interviewees were asked about risk, Mr. Deck spoke most notably about “risk appetite”. Risk appetite is the idea that different people have different perceptions of risks due to how much risk they are personally able to tolerate. Risk appetite, Mr. Deck explained, is also dependent upon other factors, such as age; older generations often had to take greater risks in their careers than is expected today. As a result, more senior staff generally have larger risk appetites than perhaps student workers. Another factor is the individual’s professional judgment and knowledge that can be used to weigh the risk. Mr. Deck further added that, depending on these factors, risk appetites vary and different individuals perceive liabilities differently because of how they view the magnitude of the risk (Woolf & Deck, 2012).

Forensic Anthropological Research in Texas

“The skeleton is the halfway point to not having existed at all” (Quigley, 2005, p. 9).

Texas State University-San Marcos (Texas State) is located in San Marcos, Texas, about half way between San Antonio and Austin. Texas State, for the most part, *is* the community of San Marcos. There are small businesses, but the overall feel is that of a university town. The Texas State campus sits north of San Marcos’ historic square. The San Marcos River headwaters originate from campus, with the water flowing through campus to the south. The campus is beautiful and expanding rapidly, which was evident in the amount of construction that was occurring on campus at the time of the site visit.

The Texas State Department of Anthropology faculty and EH&S are located on the campus. A tour of the campus initially indicated, albeit falsely, that this institution is primarily focused on undergraduate education, as there are large resident halls and dining

commons. During the interviews however, it was learned that Texas State confers all types of graduate degrees and currently offers doctorates in 12 varying majors.

Not only is the campus expanding, but programs and departmental centers have expanded within the last few years. The Department of Anthropology opened an outdoor human decomposition laboratory in 2008 along with a human processing laboratory in the spring of 2010. These facilities, along with the research, teaching, and outreach within the Department of Anthropology are referred to as FACTS – the Forensic Anthropology Center at Texas State. The mission of FACTS is to advance forensic science and anthropology through education, research, and outreach. The faculty, staff, and students conduct forensic anthropology research in human decomposition processes, the postmortem interval, human skeletal variation, and forensic osteological methods. FACTS faculty and staff work with researchers from other institutions to facilitate studies in human decomposition, skeletal variation, and osteological methods. Faculty and staff offer workshops, short courses, and other trainings in forensic anthropology and body recovery for professionals and students. Faculty members provide complete forensic anthropological case services for law enforcement, medical examiner's offices, lawyers, and others. In addition to all of these services, the FACTS faculty members also instruct graduate students pursuing master's degrees in anthropology.

FACTS Facilities

Considered a departmental center, FACTS is the administrative umbrella organization for three different facilities and the overall program. The administrative umbrella is housed under the Texas State Department of Anthropology. The three facilities of FACTS include: the Forensic Anthropological Research Facility (FARF), the

Osteological Research and Processing Laboratory (ORPL); and the Grady Early Forensic Anthropology Research Laboratory (GEFARL) (Texas State University-San Marcos, n.d.b).

The FARF is an outdoor human decomposition facility located on Freeman Ranch, an institution-owned, 4500-acre working ranch, located a few miles away from the university. FARF consists of a 26-acre double-fenced plot where the basic science of human decomposition and other research topics are studied. Currently, only a 5-acre parcel is used for decomposition research.

The newest facility, ORPL, is also located at Freeman Ranch, but is located near the Ranch House entrance, less than a 10 minute drive from FARF. The entrance to ORPL opens to a large double-smart classroom environment where training courses and conferences are conducted in human remains identification and research. The back half of the facility is used to prepare bodies for FARF and to process the remains (Osteology Research and Processing Laboratory, n.d.).

The GEFARL, located off-campus, but not on Freeman Ranch, consists of offices and a larger warehouse area that is used to house and study the Texas State Donated Skeletal Collection. Osteological and histology research equipment is located within GEFARL to allow skeletal research. Osteological research, consulting, and cultural resource assessment are all conducted within this facility.

Journey of the Body

In Texas, the journey of the body begins with the donation program. The path that it follows reflects the research and training that is conducted at Texas State. Bodies are donated to the program specifically for decomposition. Donors are educated that their

body will be used in a decomposition research study or will be used in a vulture study. The cover letter on the donation form also states that no remains will be returned to the family, as the Center curates the skeletons to be kept in perpetuity. As for unclaimed bodies, the Anatomy Board of Texas does not allow FACTS to accept unclaimed bodies. There is no serological testing to ensure that donated bodies are not infectious. As such, whole-body donations are not accepted from any interested party who has a known infectious disease. Of note, those who have an infectious disease can still donate to FACTS as long as their body is cremated and not pulverized. The rationale for acceptance is that if the body is cremated and not pulverized, the infectious disease is no longer an issue and the burned skeleton can be put into the burned remains collection. Dr. Michelle Hamilton explained that burned bone research is the next “up and coming” research. Burned bones are used to research and teach individuals how burned remains look after a fire. There are no costs associated with donation, unless transportation is greater than 100 miles from the institution. The only other cost to a donor is for cremation without pulverization, if the person had an infectious disease.

If the donor does not have an infectious disease, the body follows two different paths. If there is advanced decomposition, the body is buried at the facility. These burials are used for training exercises for law enforcement to learn how to properly exhume the body, estimate time of death, and for proper identification of remains training. If the donor does not have an infectious disease and there is not advanced decomposition, the cadaver is placed in a study or allowed to decompose naturally at the facility.

Graduate students do the majority of the work at the facility; the standard operating procedures (SOPs) guide students in their work for FACTS. One procedure requires students to have respectful demeanors when picking up the body from the funeral home, hospital, nursing home, medical examiner, or hospice. Interestingly, if the body does not originate from a funeral home, it is the responsibility of the FACTS Coordinator to act as Funeral Director to complete the death certificate.

Before placement at FARF, the outdoor human decomposition facility, clothing and any medical device, (e.g., IVs or catheters), are removed. These items are placed in biohazardous waste. Blood is taken from each donor for future DNA analysis. Photographs are taken of the entire process. Pictures include: a picture of the wooden stake with the donation date and number; a picture prior to the removal of the decedent's clothes; anterior and posterior pictures of the entire body; close-up facial shots; and a picture of the oral cavity to show the dentition. In addition, any pictures of scars or tattoos are taken. The procedure is that one graduate student touches the body, while another uses the equipment; this is done to minimize cross contamination. Wooden stakes are marked with the date of placement and the donation number. The stake is hammered into the ground by the head of the donation. Anthropometric measurements are made of the bodies; height is measured from the crown of the head to the heel. Foot measurements are also taken. Medical records are reviewed, if available. As Dr. Wescott stated, "It is good to know if the donor is a cancer patient, as the drugs will affect the decomposition. It affects the insects" (Woolf & Wescott, 2012).

After some time period, 60 days or greater, during which the bodies have been allowed to decompose, the remnants of the bodies are picked up and taken to ORPL to be

skeletonized. To skeletonize, certain sections of the body are placed in an institutional-sized kettle and smaller sections are placed in crockpots to cook the tissue from the bones. The skeleton is then dried and numbered, placed in a box and transported to the GEFARL to be added to the Texas State Donated Skeleton Collection.

During the site visit for this study, a tour was conducted of the FARF. Access to the decomposition facility was obtained through a locked gate as well as a key carded gate. Security is taken seriously, even with the remote location, to ensure that studies are completed and donors' anonymity is safeguarded. After arrival, shoe covers were donned over the required close-toed shoes. While on the facility, the shoe covers prevent the shoes from picking up any contamination from the decomposing bodies and transferring it outside of the facility. After the first bend in the dirt road, the "cages" became obvious. Unless part of a vulture study, bodies are placed under large cages to keep the vultures from scavenging. The new bodies in the field were white and bleached out. Within this part of Texas, the bodies usually mummify over time, as the heat dries the bodies quickly. During this visit however, the weather was unusually wet and cadavers were covered with various colors of mold. Orange, black, and green molds were witnessed.

The bodies left for natural decomposition help researchers understand the basic processes of decomposition, which builds the knowledge base surrounding the science of decomposition. The bodies also allow researchers to explore the variables that affect decomposition, such as temperature and humidity. There are no computer models to simulate or estimate decomposition. As for the decomposition process itself, the face and the genitals degrade first, as they are the openings to the body. Flies lay larvae for maggots on the tongue. Gas occurs during the process of decomposition and the body

bloats until a split in the skin occurs either under the armpit or around the hip bone which allows the fluid to escape. As such, there were stains around each body, the size of the stain relative to the size of the body, most stains reaching well outside the caged area.

In addition to decomposition studies, vulture studies are conducted as well. For these studies, the cages are not placed over the cadavers. Dr. Wescott stated that a body can have up to 50 vultures on it during a vulture study. The birds can transport a body 20-30 feet or more from where it was originally placed and it can be disarticulated during transport. The bones are picked clean within days. The skulls from vulture scavenging show a characteristic break in the bone between the eye sockets on the inside of the eye. The assumption of this characteristic break is that vultures tend to peck the eyeballs out first. Vulture studies are necessary to be able to gather data on human remain identification and location for law enforcement purposes (Woolf & Wescott, 2012).

Studies conducted for researchers from other institutions also occur at FARF. FACTS administration allows researchers to study bodies, as long as they fill out the appropriate paperwork. At the time of the site visit, another Texas institution was conducting an entomology study on two cadavers, controlling insect access on one cadaver and not on another. No official fee schedule has been set for cadaver and facility use at FARF. At the time of data collection, it was handled on a case-by-case basis.

FACTS Staff

The leadership of the FACTS facilities includes three faculty affiliated with the Texas State Department of Anthropology, Dr. Daniel Wescott, Dr. Michelle Hamilton, and Dr. Kate Spradley. Each was interviewed separately. All have extensive experience in forensic anthropology. In addition, they all received post-graduate education at the

University of Tennessee, as Tennessee was the first successful decomposition facility in the United States.

Drs. Spradley and Hamilton worked at Tennessee and cumulated over 19 years of experience in decomposition facilities. As such, the Standard Operating Procedures (SOPs) and public relation strategies are mirrored from Tennessee. As Dr. Spradley noted, “We have the benefit of hindsight”. Drawing from their Tennessee experiences, all three have expressed confidence in their ability to be successful in promoting the facility to the public. In addition, Dr. Hamilton described the necessity of “winning” over the administration of the institution, stating “You must get support from the top down and then you get the community support” (Woolf & Hamilton, 2012).

“Transparency” was a word that all three professors used extensively during the interviews in relation to dealing with the public. Dr. Hamilton explained: “For a decomposition facility to exist, there has to be transparency between our operations and the public”. Kate Spradley also said,

We tell people in the community that this is what we do, even beyond people knowing this is what you are going to be used for. We don't hide anything and then we report that to the community and I think it is really important that the community knows what we do. I come from Tennessee where everybody knows what the body farm is, everybody knows what goes on out there, and they love it. They are proud to have it in their backyard (Woolf & Spradley, 2012).

As for health and safety, the professors all stated that they maximize the health and safety of their staff and students by not accepting any unclaimed or infectious bodies. In addition, they practice Universal Precautions and endorse the use of PPE. They cited

lifting as a continual concern, as all three have back injuries from lifting bodies at some point in their careers. Additional concerns, although they acknowledged that there are no easy answers, included how long methicillin-resistant *Staphylococcus aureus* (MRSA) stays active in the body and the implications of possible exposure, as well as if exposure occurred, issues about mold. Another common concern in research was how to actively encourage and warrant good safety habits within the graduate student cadre. This included wearing all of the prescribed PPE whenever the students worked with donors at FARF and at ORPL.

In regard to the body as a person or property (i.e., thing), Kate Spradley stated, “Cadavers are not a thing. We call individuals our donation – this is donation number XYZ. They or their family donated them to us and it is a person” (Woolf & Spradley, 2012). From the SOPs, the word donor is used specifically when referring to the body. Of note, when a skeleton is placed into collection, the boxes are numbered. This number corresponds with the donor paperwork.

Community service and public safety occur hand in hand at FACTS. While visiting, a cadre of graduate students was sent on a case to assist law enforcement. The case concerned a body that was missing and thought buried in a farmyard. The students assisted with excavating and identifying the remains. Through this avenue, FACTS faculty, staff, and students assist law enforcement, complete community service, and conduct public safety services for the citizens of Texas.

Safety Oversight

Ms. Elsie Romano has worked for Texas State Environmental Health and Safety (EH&S) for the last six years as the Laboratory Safety/Biosafety EH&S Specialist. Her

education is in biology and she has prior experience working in laboratories, making her a natural fit for her position. At the beginning of the interview, Ms. Romano seemed a bit nervous and, as such, the interview was not audio recorded. (This may have been because of her perception that, as Director of EH&S at the University of Nevada, Reno, the investigator was there to judge her program.) Therefore, the following description was derived from notes taken and documents obtained during the site visit.

The EH&S staff at Texas State currently has six staff members, although they recently have been given approval to hire two more staff. The EH&S office includes all of the common EH&S programs, along with risk management/worker's compensation and Fire and Life Safety. The organizational chart revealed that the staff consists of the Director, an Assistant Director, and EH&S Specialists in the area of Lab Safety/Biosafety, Fire and Life Safety, Environmental/Waste, and Construction Safety. The department also has eight to ten students to assist the staff in program implementation.

Ms. Romano spoke fluently about the FACTS facilities and was familiar with the operations at each facility. Ms. Romano described the purpose of each facility and the processes that are used for studying decomposition and human remains identification. When FARF became operational and ORPL was built, the FACTS staff *walked* Ms. Romano through the entire process so that she could understand what EH&S work would be needed and what trainings would be required. Ms. Romano witnessed how a body is received and prepared for FARF. This included how it is undressed and removal of any medical device that is attached to the body, such as a feeding tube, catheter, or IV. These

items, along with any other items that touch the body, are disposed as biohazardous waste, which falls under her jurisdiction.

Currently, EH&S provides training in exposure control/bloodborne pathogen exposure. Ms. Romano provides the class in person and through the online training system. It is the responsibility of the staff of the Anthropology Department to handle the Hepatitis B declination forms and to offer the Hepatitis B vaccination, as required by law. Ms. Romano stated the other trainings that are essential for the type of research conducted through FACTS are Hazard Communications, PPE, and back safety for lifting. In addition to training, Ms. Romano conducted a PPE evaluation and has documented the following PPE be used for FACTS research – gloves, shoe covers, and protective sleeves. If bodies are skeletonized or processed, eye protection and aprons are also needed. The waste that is generated from the skeletonization process is also a biohazardous waste. This waste is stored in a 1500-gallon tank at the facility, but at the time of the study had not exceeded that volume. As such, the waste had not been shipped off-site for treatment.

Identified Themes

Ambiguity of Cadavers as Person and Property

Perhaps sensitized to the issue of the attitude towards death in the western culture as a result of conducting the literature review prior to data collection, the theme, ambiguity of cadavers as person and property, quickly emerged in the participant interviews and was supported through document reviews and field note observations. In essence, whether the body was considered a person or property, was both clearly articulated and comingled or obscured.

At Baltimore, the body arrives at the facility as a *person*. At this point, the body has a name and, if donated, an associated family or next-of-kin who are following the last wishes of the deceased. Upon acceptance, however, the Board claims control of the body immediately. Unclaimed bodies are slightly different; control is assumed by the Board within 72 hours per the law. Once the body is under the control of the Board, a shift in definition occurs. At that point, the body becomes *property* (i.e., the Board can make unilateral decisions about the body). This statement was clearly articulated by the Director,

Any practice on a cadaver should be done with authority, with an informed consent. It goes back to what authority I have, you know. I showed you our donor form. Our donor form is very (pause). The body rests with me; I hold the property interest in that body. It is at our discretion (Woolf & Wade, 2012).

The shift in status from person to property was clear. A number is placed on the body through a metal ear tag, written on the torso, and written on any disarticulated part. Although the number allows a cross-reference to the donation paperwork, this is the step where the institutional officials relinquish the person aspect of the body and move toward treating the body as quasi-property, as recognized under English common law. If the remains were requested by the family, the remains became a *decedent* again, shifting back to person.

The definition of the body was not as clear at Texas State. The Standard Operating Procedures (SOPs) and professors emphasized using the term *donor*, implying personhood. Staff members educate the donors (while living) to know specifically what purpose their body will have at FARF (e.g., the study of decomposition rates, the

teaching of the identification of remains, etc.). Regardless of what happens to the body, the staff always refers to it as donor. Indeed, it appeared that the staff understood the relationship to be between FACTS staff and the donor, not the surviving family members.

The ambiguity is that once the body arrives at FARF, the decisions regarding the actual use of the body are made by the staff; surviving members are never consulted. In addition, when the body is skeletonized, the skeleton is put into a box to be curated for perpetuity in the Texas State Donated Skeletal Collection. The box, itself, is numbered, again, indicating property. No remains are given back to the families, so the body does not ever become a person again, *per se*, and becomes an item more amenable to be inventoried similar to other property.

Semantics

The second theme, semantics, emerged from the interviews and is integrally linked to and expands upon the first theme. Within the interviews, it was noted that different terms were used to describe the dead at different phases of the journey of the body. It appeared that the deciding factors in the terms used were either the audience or the purpose of body or body part. For example, Mr. Wade used the term *decedent* before control of the body had been transferred to the Board. He also used this term when discussing the body with the grieving family or next of kin. A *cadaver*, in his view, is an embalmed body where a number has been attached to it. The word *specimen* was used for flushed or treated bodies that may or may not have been disarticulated for training or study. Specimen was also used for pieces of bodies that have been specially preserved for use in perpetuity. Of note, the entire Board staff in Maryland used terminology consistent with Mr. Wade.

At Texas State, semantics around the body were actually quite simplistic. The FACTS administration and students called the body a *donor* and only a donor. Within all of the procedures and policies, reference to the body is through the word donor. The only time that the word donor was not used was when talking about skeletons, but Texas State FACTS administration was adamant to state that the skeletal collection was built from donors.

Cross Case Analysis

The comparison of these two programs must be understood through the lens of the two distinct purposes of the programs. In Baltimore, bodies are needed for clinical training and anatomical study specimens, while at Texas State the bodies are needed for decomposition research and/or law enforcement training. An important difference between the two operations is that Baltimore conducts their work within buildings, which is essentially private. At Texas State, much of their work is out in the field and potentially exposed to the public. The cultures of operations are also vastly different. Texas State FACTS faculty, staff, and students operate a decomposition facility that has to function with total transparency for acceptance by the public. The Board operates within the culture and traditions of the medical community, which historically have not been as transparent to the public.

Staff at both programs believed that they were fulfilling a public service beyond the research and training that were being conducted at their sites, although this was expressed differently in the two different locations. In Baltimore, they specifically referenced their public health mission. What was particularly notable was that they referenced that they served the common good by handling unclaimed bodies that, in other

states, the counties were responsible. Furthermore, they are very careful about their serological testing to assure that public health concerns are addressed. In contrast, Texas State FACTS faculty believed or maintained that their public service was related to public safety issues in that they were training law enforcement; graduate students assist law enforcement on active cases when requested.

The cultures of the two programs also revealed similarities and differences. Both Centers exhibited characteristics of both old and new. The traditions and culture at UMB and with the Board are steeped in history and quite stable. In contrast, Texas State is a much younger facility, as the facility was commissioned and opened in 2008. However, this superficial view is misleading. Despite the fact that the Baltimore program has been around since Edgar Allan Poe, the Director, Mr. Wade arrived at the facility in 1973 and has since developed and implemented virtually all of the programming currently in effect. Likewise, the staff at Texas State may have been hired recently, but all of the key staff previously worked in Tennessee at the Anthropological Research Facility under Dr. Bass. Even though the culture was not as mature, by having a common experience at Tennessee, (as Tennessee was the first successful decomposition facility in the United States and Dr. Bass is a world-renowned expert in forensic sciences) the practices at Texas State FACTS are more established than anticipated. All of the practices are mirrored after those at Tennessee. Indeed, even the donation forms are similar to the ones used in Tennessee.

Both programs utilize body donations. However, how the programs were administered is quite different. At Texas State, the body donation informed consent was specific. Before donors register, they are informed that remains will not be returned.

They are also informed that their remains will more than likely decompose at the facility and their skeleton will remain in a collection for future study. In Baltimore, the informed consent is much more open ended. The donor may not know specifically in which program his or her body will be used, as the Board can make that decision unilaterally. The other difference is that remains can be returned, if requested.

The other difference was primarily found through observations rather than interviews and documents. Because staff at Baltimore recognize their public health mandate, much more testing is done on the bodies that arrive at the facility. What was particularly noteworthy was that Baltimore had an exponentially larger number of bodies arriving, but nevertheless, serological testing was a high priority. One of their greatest fears was unknown infectious agents. This appears to be because the Board was under the umbrella of the state health department. The concern was expressed at Texas, but felt to be not feasible because of the financial impact on the Medical Examiner's office. Staff in Texas also worried about other infectious agents, particularly MRSA, as not much research has been done on MRSA to know if it survives when the person dies.

Summary

In this chapter, an introduction was given on each case through analysis of the data obtained from participant interviews, document analysis, and field notes from general and site-specific tours. For each case, the body donation program, the purpose or journey of the body through the various purposes and a description of the facilities where the cadavers or donors are used were reviewed for understanding and for cross-case analysis.

Themes emerged on the ambiguity that western culture relates to death. This ambiguity is transferred to the body when used in research and training by transferring the decision-making process to the institutional officials. The ambiguity occurs when the public may view the body as a person versus when the institutional official views it as quasi-property to determine purpose and use. A sub-theme was identified on the semantics used when discussing the dead. Different words were used to describe the body, dependent on purpose and dependent on profession or audience when discussing the body.

The next chapter will present and analyze the data obtained from participant interviews, document analysis, and field notes from general and site-specific tours, in relation to the research questions. In addition, the data gathered will be related to the theoretical framework of the study, as to the political and symbolic frames of Bolman and Deal's organizational theory (Bolman & Deal, 2008). Rounding out the chapter are the conclusions, implications for practice and recommendation for further research.

CHAPTER V

DISCUSSION AND CONCLUSIONS

Introduction

The purpose of this study was to explore how institutional administrators perceive safety, ethical, and legal liabilities in regard to using the newly dead for clinical training and forensic anthropological research. A multiple case study was undertaken to answer the research questions. In the preceding chapter, the presentation and analysis of the data have been reported. Three research questions guided all aspects of this study:

- 1) How do institutional officials perceive liabilities in regard to potentially ethically or politically charged research and education endeavors?
- 2) What safety and health considerations need to be addressed when allowing anthropological research and/or clinical training on the newly dead?
- 3) What ethical issues and legal considerations are of concern when using the newly dead and what programs and/or processes are put in place to understand and mitigate these issues?

Collectively, participant interviews, document reviews and on-site observations from each case provided a view of institutional administrators' perceptions of liabilities in regard to safety, ethical, and legal aspects of using the newly dead. Data sources also revealed the important factors to be considered and implemented to mitigate these liabilities. Themes emerged through the interviews in regard to discussions on control of the cadaver, which revealed the theme of body as a person, body as quasi-property, and the purpose of the body. A sub-theme emerged around semantics used when referring to cadavers, primarily dependent upon the described purpose of the body and the audience

that the speaker is addressing. This chapter begins by answering the three research questions and discussing the results in relation to the theoretical framework of Bolman and Deal's organizational theory (Bolman & Deal, 2008). Rounding out the chapter are the conclusions, implications of the findings, and recommendations for further research.

Research Questions

How do institutional officials perceive liabilities in regard to potentially ethically or politically charged research and education endeavors?

The perceptions that institutional administrators held regarding the liabilities of working with the newly dead was predicated on the principles of risk. Three specific types of risks were identified within this study: known risks, unknown risks, and what may be characterized as more nebulous risks. The known risks were grounded in exposure to bodily fluids and subsequently contracting an infectious disease. This risk was most clearly articulated by staff in Baltimore. It was also identified in Texas, but did not occupy the same sense of priority. The program does not require the draining of bodily fluids prior to decomposition, nor do they do serological testing.

The unknown risks were understood to be infectious agents about which there is a lack of clear understanding within the research literature or that research has not been conducted to identify the magnitude of the risk. MRSA was identified particularly by the staff in Texas; prions were identified by the staff in Baltimore. Both program staff were concerned about antibiotic-resistant tuberculosis.

The more nebulous risks involved public relations issues. Staff at both sites recognized the sensitivity about using the newly dead in clinical training and research. Although the nebulous risks were revealed at both sites, they differed between

institutions. Public relations efforts at Baltimore centered on the donation process and why cadavers are needed, but information was not provided about how the body would be specifically used. The donor consent form of the Texas program was much more transparent on the use of individual cadavers. Perhaps, this was because, at the time of the study, there were only a few approaches to the type of research conducted at FARF; donations were critical to ensure that research could continue to be conducted at the facility. The transparency also informed the community of the research to maintain public support for facility operations.

The UMB EH&S Assistant Director used the term *risk appetite* to describe the amount of risk an individual is willing to tolerate. Mr. Wade agreed that risk perception is developed within each individual through education, professional judgment, and knowledge. “Risk is in the eye of the beholder”, stated Mr. Wade (Woolf & Wade, 2012). This may account for the varying degrees of risk tolerance between professional fields and between individuals. Although risk tolerances varied between individuals within this study, institutional officials identified known, unknown, and nebulous liabilities and have worked to mitigate the risks and to minimize these liabilities for their institutions. They understood that to conduct this research and training, there is an acceptance of some risk.

For instance, for the first group of risks, the known risks, there was little appetite for acceptance of the liabilities, particularly in Baltimore where the program is under the auspices of the State of Maryland Department of Health and Mental Hygiene. These risks were clearly acknowledged and programs were in place for their mitigation. The second group, the unknown risks were on the staff’s “radar screen”. Staff carefully followed the literature and had discussions within their professional networks. Indeed, it

appeared that the tolerance or appetite for unknown risks was that they would like to acknowledge when they could become known risks and treat them accordingly. The third group of nebulous risks was most acutely felt in Texas where they needed public support to operate their facility.

What safety and health considerations need to be addressed when allowing anthropological research and/or clinical training on the newly dead?

The main safety and health consideration found in this study was exposure to infectious agents. Physical ergonomic issues related to lifting were also identified as a safety and health consideration during the interviews. In addition, the use of drills, saws, and scalpels were a concern, particularly in situations when a staff member could be cut or hurt.

To minimize exposure to infectious agents, the Board Director and staff in Baltimore: reviewed death certificates and the cause of death; inspected the body for indications of drug-use or body piercings; conducted serological testing for HIV and Hepatitis B; and flushed the body with a disinfecting agent. All of these activities minimized the training participants' exposure to infectious agents and thus minimized the institutional liability and the risks to faculty, staff, and students. The situation was similar at Texas State FACTS operations. Unclaimed bodies were not accepted; no infectious bodies were accepted for research at FARF; death certificates were examined for the cause of death; and personnel protective equipment was prescribed to employees for handling and processing cadavers. All of these activities minimized the risk of being exposed to bodily fluids and contracting an infectious disease.

To further decrease the risk from becoming infected via bodily fluids, both Baltimore and Texas State institutional administrators prescribed to the OSHA Bloodborne Pathogen Standard (Standard) and have instituted the culture of Universal Precautions (U.S. Department of Labor, Occupational Safety and Health Administration, 2011). Universal Precautions is the concept of treating all bodily fluids as infectious. Theoretically, by treating every cadaver and all bodily fluids as infectious, the faculty, staff, and students are forced to use the best work practices available (Demiryurek et al., 2002; Hardin, 2000; Watkins et al., 1998; Cahill & Freeland, 1992). In addition, under the Standard, all required PPE should be worn and the utmost care should be used when handling cadavers and bodily fluids. These actions, along with offering the Hepatitis B vaccine as required by OSHA, maximize the health and safety of faculty, students, and staff when working with unembalmed bodies (U.S. Department of Labor, Occupational Safety and Health Administration, 2011).

Infectious agents with unknown risks, (e.g., prions and MRSA), were dealt with a little differently than known risks. To rule out a possibility that a brain may contain prions, in Baltimore, the death certificate was examined in reference to the age of the deceased. If the person was 85 years old and died of dementia, the risk was deemed minimal in regard to being infected with prions. In comparison, a 60-year old dying of dementia would have been considered a much higher risk for prion formation. The Board Director reviewed these circumstances closely, using professional judgment and knowledge, on when to use a brain and when not to use brain tissue. At Texas State, staff was concerned about MRSA. Interviews indicated that no research has been documented indicating if MRSA remains viable when the person dies. Also, MRSA may not be listed

on the donor death certificate as the primary cause of death, if it is listed at all. Current practice with the use of Universal Precautions was thought to protect the faculty, students, and staff from these unknown risks. However, at Texas State questions linger.

As for the physical ergonomic issues while lifting, most participants in the study discussed life-long back issues resulting from accidents lifting cadavers. Within some of the interviews, this was one of the biggest concerns of working with the dead. By acknowledging this risk, back braces, gurneys, and proper lifting protocols were established to minimize the risk of back injury or continued back injury to faculty, students, and staff at both institutions.

Another potential risk that was acknowledged in Baltimore was the use of saws, drills, and scalpels. All personnel were properly trained and had experience using this type of equipment. The largest concern for the Board staff was not personally using this equipment, but the potential liabilities when the clinical training participants leave scalpels and other sharps around the body or in the body bag after a training session.

What ethical issues and legal considerations are of concern when using the newly dead and what programs and/or processes are put in place to understand and mitigate these issues?

To alleviate potential legal and ethical issues, both centers have institutionalized willed-body donation programs with written consent constructed to reflect the respective program. In Texas, the overwhelming issue was public acceptance of a decomposition facility. Transparency was thought to ease any ethical issues as donors were specifically informed that their body will decompose at the facility and that their remains will not be returned. “We follow all the rules of the willed-body donation program and then there is

the basic professional ethics that have to be followed”, stated Dr. Wescott (Woolf & Wescott, 2012). “We ensure there are no question in regard to ethics by transparency, openness, and promotion with the public and a developed health and safety regimen with researchers and students”, added Dr. Hamilton (Woolf & Hamilton, 2012).

Legal requirements for whole-body donations differ from state to state as the UAGA provides guidelines only for the formation of uniform state laws. Only nine states have Anatomy Boards and many of them only put forth policy (Woolf & Wade, 2012). Most of the Anatomy Boards do not operate as a consolidation of willed-body donation programs and donor acceptances along with distributing cadavers to institutions, as was found in Maryland. This may be due to an increased geographical area in larger states where distribution of bodies would be costly and time consuming. As the laws differ state-to-state and Anatomy Boards function differently, willed-body programs are usually formed and administered by each school needing bodies for study. This can cause inconsistencies in donor programs not only between states, but within states. Additionally, the institutions must know the laws of their individual state and follow those laws. As stated by Dr. Spradley,

We make sure that we are legally operating within all the laws that we are able to accept bodies under the Anatomical Gift Act and, underneath that, we comply with all Texas health and safety codes in relation to who is defined as the next-of-kin (Woolf & Spradley, 2012).

In Baltimore, the legal and ethical issues were not as pressing as in Texas. Their operation was defined in statute in 1949, providing both legitimacy and longevity. However, Mr. Wade was very sensitive to the family grieving process. An interesting

distinction between the Texas and Baltimore program was that, in Baltimore the ashes are returned to the family, when requested. As supported in the literature, proper care of the body can ease the family and next-of-kin concerns and mitigate any harm as the pre-mortem desires and preferences are being followed (Wicclair, 2002). Both institutions emphasized treating the donor's family with respect. Both identified that the work with grieving families was the most time consuming, took the most skill, and was the most underestimated function of administering the donation program. Both believed the time dedicated for this task was necessary, as the more the families and next-of-kin can understand what happens with their loved one, they will not have concerns later that could become ethical issues.

The second means of alleviating ethical and legal issues was through public outreach efforts. Staff at both programs understood their work to be more than clinical training and research. Both viewed their work as fulfilling a higher purpose. In Baltimore, their calling relates to public health. The Board accepts unclaimed bodies and incurs the cost for all counties in Maryland for disposition of the bodies in a safe and acceptable manner. In Texas, their calling relates to public safety. In addition to their decomposition facility, which assists law enforcement, Texas State graduate students assist law enforcement in active investigations. Although both of these activities are related to the purposes of the centers, they are a direct benefit to the communities in which the facilities operate.

Discussion

“All the corpses in the world are chemically identical, but living individuals are not” (Jung 1950/1990, Kindle Location 2617).

Cantor (2010) argued that western culture continues to demonstrate an aversion to death. The conflict, however, is a natural (and inevitable) phenomenon. People die and the dead body can be an important tool for medical and forensic training, knowledge, and discovery. Furthermore, for public health reasons, consideration of the disposition of dead bodies is imperative. The findings of this study revealed how staff at the two programs used informed consent to approach this conundrum.

Willed-body donation programs must have an informed consent for donors to sign. The informed consent generally includes a statement indicating that the living donor is of sound mind when making the decision to donate. Wicclair (2002) defines consent as agreement by an individual with sufficient and adequate information to make an appropriate decision. The informed consent certification requirements for signatures follow the same basic processes as wills and trusts in those two witnesses must sign, indicating that the donor is of sound mind and signing by their free will, when gifting their body.

The question arises, does consent to donate make the body property after death, as the use of the body is transferred from the family to the institution? As in regard to property, English common law describes the body as *res nullius*; something that cannot be owned and the cadaver retains a *special status* (Cantor, 2010). Although legally the body may not be defined as something that can be owned, in Baltimore, the body was viewed as quasi-property to allow decision-making about the use of the body to occur solely by the Board. Another indication that the body was treated as property was that it was given a number. Mr. Wade stated,

Any practice on a cadaver should be done with authority, with informed consent.

It goes back to what authority I have, the body rests with me, I hold the property interest in that body. It is at our discretion how it is used (Woolf & Wade, 2012).

The body as property was also true to an extent in Texas, as the decision to place the body within different research studies is made when the body reaches the facility without prior approval from the decedent. Likewise, the skeleton is also given a number, similar to an item that is owned.

Interestingly, unlike property rights, although an informed consent is signed, the documents are not considered legally binding. This alleviates any legal issue when the donation has not been accepted by the family. Dr. Hamilton explained,

Our donation documents are not legally binding documents. If a person decides to donate themselves and upon death their family decides they do not want that to occur, we are not going to fight that. We want to make sure there are no legal issues. We take bodies that are donated and if people change their mind mid-stream, that's fine (Woolf & Hamilton, 2012).

Nevertheless, both programs attempt to give more authority to the decedent and/or the next-of-kin than standing medical traditions in many teaching hospitals. Within the literature it was reported that clinical training occurs in hospitals on bodies where consent had not been obtained (Morag et al., 2005). In both Baltimore and Texas, consent is obtained. Nevertheless, the question can be asked if this is truly informed consent, as the donor does not know what actually occurs with their body. In regard especially to Baltimore, Mr. Wade felt that the donors' family had the right to know what occurred with the body of their loved one, but only at the conclusion of the clinical

teaching and/or research. Mr. Wade's thought was that if donors had a choice on how their body was to be used, administratively, this would have been a nightmare. He felt it imperative that decision-making authority be given to the Board Director to ensure that the training and research needs could be adequately met. The approach to informed consent in Baltimore alleviates the problem of training medical professionals on patients who have just died within the hospital, but not signing any consent for the use of their body (Fourre, 2002; Iseron, 1993; Morag et al., 2005; Wicclair, 2002). Furthermore, by viewing the body in a quasi-property state, while in the Board's care, the purpose of the body can be defined outside the family confines. As the family cannot separate the body as person (Tomasini, 2009), this is a necessary step to allow medical teaching, research and knowledge and to efficiently use the body to the greatest extent, which includes disarticulation. No discussions are held specifically on the purpose of the body unless warranted to protect public support.

Donor education was also considered part of the consent process for both programs. Giordano (2005) agreed that if the public is educated on why it is important for science to use the newly dead, that most people exhibit an altruistic behavior and will donate. Texas State FACTS personnel have mandated this as a requirement in order to maintain community support and to also make sure the donors understand that the remains will be curated in perpetuity. Within the medical community, this transparency is not as clear because of the culture and tradition of medicine, including the previous tradition of body snatching (Feinstein, 2004; Roach, 2003; Teward & Patterson, 2002). Historically, information about cadaver obtainment and use was not freely shared. In addition, it is not known what the body will be specifically used for until a body is

requested by clinicians for trainings or by faculty for dissection. Also, donor education could influence the right-to-choose, which would impede upon the quasi-property rights of the institutional officials in making decisions regarding the use of that body after control has been transferred. Mr. Wade was a proponent for educating the donors to the use of their bodies, but reserved this decision-making right, so that the body may be used where needed. As such, the transparency of how bodies were used in clinical training was not as clear as forensic anthropological research.

As the public in western culture does have a fear or aversion to death, cadaver use can become controversial quickly. Instead of the public becoming educated in the benefits of cadaver use and accepting that the dead can assist the living, the public can find the topic distasteful, so the discussion are often not conducted. As the public demands knowledgeable and competent medical personnel and trained law enforcement for criminal investigations, do these demands minimize risk to the point where unnecessary risks are taken in order to produce these trained individuals? In addition, where medical personnel can have day-to-day exposure with infectious disease with living patients, does that bias the perception of risk when training on unembalmed tissues?

By not having frank discussions about death and/or not being educated about what occurs to the body after death, creates an environment where cadaver use is not controversial until an article is discussed in the press or pictures are distributed on social media. At this point, the uneducated public becomes incensed about the indignity that occurs with the use of cadavers. If the general public knew how cadavers were used, this effect could be minimized, as in the case of FACTS where the institutional administrators

have worked to minimize this affect by making information readily available to the public to garner public support for the decomposition facilities.

From the interviews, all study participants admitted that the historical use of cadavers was controversial, but none of them believed this is true any longer. “If we render reasonable care of the body, we minimize the chance of any controversy,” stated Mr. Wade (Woolf & Wade, 2012). Reasonable care of the body included treating the body with dignity and respect, as also evidenced in the literature (Tomasini, 2009; Wicclair, 2002). The most controversial topic discussed by the participants that has occurred at other institutions was the proper training of staff and students to realize that placing pictures of cadavers on social media is controversial and does not provide for reasonable care of the body as expected by the donor. Dr. Hamilton stated, “For me, I consider it unethical and immoral to use bodies as a display object for people that are just interested” (Woolf & Hamilton, 2012). FACTS administrators were clear in their training and expectations of the students and how they were expected to treat the cadavers. Stated Dr. Hamilton,

In terms of student behavior around bodies, you have to instill in them before they ever go to the facility. They have to realize that people are donating themselves as gifts. This is the most generous thing a person can do upon their death is to devote themselves to knowledge, to scientific research, and to appreciate that gift (Woolf & Hamilton, 2012).

The use of cadavers can also be related to the organizational theory of Bolman and Deal (2008). Bolman and Deal stated that an organization can be analyzed through four frames. These four frames include symbolic, political, human resources, and

structural. Bolman and Deal (2008) considered that a frame is a mental model or a set of ideas and assumptions that help a person understand and negotiate a particular “territory” (p. 11). These frames are built over time as a person develops beliefs, values, practices, and artifacts that work. Bolman and Deal (2008) stipulate that these frames anchor the organization’s identity, culture, and sense of self. The two frames that were critical for this study were the symbolic and the political frame. Bolman and Deal (2008) stated that the symbolic frame centers on complexity and ambiguity and emphasizes the idea that symbols, including traditions, mediate the meaning of work and anchor culture.

When examining death and the traditions around death, the meaning of the symbolic frame emerged along with the identified theme from this study, the ambiguity of death in relation to the cadaver as person, as property, and the purpose. With western culture’s aversion to death there is symbolic meaning to discussing death. This includes all aspect of death, the products of death and the process of decomposing. For example, many people have no concept of the process of embalming, although they may choose this method of preservation when they die. In addition, as a non-decomposed body is the physical manifestation of a loved one, it is difficult to separate emotion from the body and view the body as anything less than a person (Cantor, 2010).

The staff in Baltimore dealt with death within an established medical culture. Compounding this is the culture or tradition of medicine and the tenuous tradition of how bodies were first garnered for anatomists (Feinstein, 2004; Roach, 2003; Teward & Patterson, 2002). Within the literature, clinical training is defined as a societal good (Fourre, 2002; Tabas et al., 2005), and some relegate the responsibility to provide well-trained doctors to society (Iseron, 1993). This societal requirement or need is also a

symbolic or a traditional expectation, yet society does not want to talk about the dead bodies used to teach an emergency room doctor procedures necessary for the ER; procedures that could save the societal member's life.

In Texas, they dealt with death directly, as they relied upon the public acceptance for their facility to operate. For Texas State FACTS faculty and staff, the term donor was used throughout their process and procedures. The term donor, along with the transparency that the Texas State FACTS administration had strived to institutionalize within the community, was used primarily for acceptance from the public and to engender community support. If the San Marcos public constituency were not to accept the activities occurring at the decomposition facility or body farm within the confines of their community, the body farm would cease to exist. Thus, there was a very different set of semantics used when discussing the dead at Texas State FACTS.

At the crux of the ethical debates, and associated with the control or purpose of the body, is the issue of what we call "the dead". Different words are used to describe the body dependent on purpose and dependent on profession or audience when discussing the body. Ethicists, anatomists, morticians, forensic anthropologists, and the public, all use different terms to describe the body. These terms also change relative to function, as in the purpose, and in relation to the audience. Within the literature, medical ethicists use the term the newly dead when discussing the use of unembalmed bodies for clinical training purposes (Wicclair, 2008). Primarily this definition grew from the historical use of training residents on the body right after the person died. Anatomists and morticians use different terms defining the dead body. These terms are different for different stages of the body's journey dependent on use and upon the audience to whom the mortician or

anatomist may be speaking. For example, when discussing the donor body with the grieving family, Mr. Wade used the word *deceased* or *decedent* to describe the body. Once the body was embalmed it became a *cadaver*. If it was flushed or disarticulated and plastinated, it became a *specimen*; the definition potentially further removing the dead from an individual person and more toward scientific study. However, the new preferred term, listed in the Journal of Clinical Anatomy, used to describe cadavers is Post-Mortem Human Subjects or a PMHS for short (Roach, 2011). When Mr. Wade was asked how he felt about this term, he stated, "They are trying to be politically correct, but in my view, it is not a subject. To me it sanitizes it too much. It is either a cadaver, or a decedent, or a mummy" (Woolf & Wade, 2012).

The symbolic frame also includes the public's expectation of what it means to be donated to science. From the interviews, along with the literature, most living donors envision their dead body becoming a cadaver within a gross anatomy lab for dissection. As new medical instrumentation is developed and new surgical techniques are discovered, this traditional use of dead bodies may not occur. Dissection may not be the use of the donation. This has implications for the future of donation programs.

Bolman and Deal (2008) discussed how the political frame plays a major role in the decision making and development of an organization. Politics is simply, "the realistic process of making decisions and allocating resources in a context of scarcity and divergent interests" (pg. 190). For this study, the political frame includes the transfer of the control and the power over the body. Therefore, decision-making of what types of research the body will be used for and the ultimate disposal of the body come under control of someone other than the next-of-kin or family. Thus, the body is commonly not

viewed as a person any longer, but as an object that can be manipulated to the user's needs. This is where unethical behaviors have resulted in the mismanagement of cadavers, such as in the cases of Tulane University or UCLA (Lin, 2009; Ling, 2004; Mangan, 2004). To minimize these unethical behaviors, Mr. Wade suggested that a federal law should be enacted that provides a minimum standard that all states must use to build anatomical gift laws concerning whole-body donations. As noted earlier, the UAGA is only considered guidance to the states, so laws between the states on willed-body donation programs are not consistent. The UAGA's main purpose is also for donation of tissue for transplantation and not for whole-body donations (Kurtz et al., 2007; The National Conference of Commissioners on Uniform State Laws, 2008). By establishing a federal minimum standard, state legislators would write similar state laws to provide for consistency between all willed-body programs designed for whole-body donation for medical teaching, research, and the acquisition of knowledge.

Along with this idea are society's expectations for competent medical personnel and law enforcement. These expectations drive policy decision-making dependent on the resources that need to be allocated to produce these types of individuals and thus protect society's interest. Within the policy-making, decision-making realm, as the UAGA is only guidance and tissue donation and whole-body donation are considered under the 10th Amendment of the U.S. Constitution a "states-right issue", these decisions also are within the political frame.

Implications of the Findings

Three recommendations can be derived from this study. These recommendations evolve around: (a) willed-body donation program, (b) standard operating procedures to

minimize any health and safety risk, and (c) public outreach to the purpose of these programs. A well-defined willed-body donation program is necessary to avoid ethical and legal issues. This willed-body donation program should include a carefully constructed informed consent process and documentation. In addition, there should be donor education and transparency in the use of cadavers (Fourre, 2002; Giordano, 2005; Morag et al., 2005). These programs also need to have trained staff willing to assist grieving families and the next-of-kin to not only work through the donation process after their loved one has died, but to also assist in their grieving process by fulfilling the deceased's last wishes.

In addition, health and safety considerations must be addressed to ensure the safety and health of faculty, staff, students, and training participants. Mitigatory measures must be considered, including: when not to take a donation; whether the program will do serological testing; how to assess or who will assess the death certificate; prescribing of the proper personnel protective equipment; and how to dispose of biohazardous waste. All of these programmatic aspects should be included in written policy statements and procedures to ensure the consistent implementation of the program, as described. Interviews and observations suggested that the EH&S staff should be integrally involved in the design and oversight of health and safety SOPs.

Informing the public through outreach efforts can mitigate both political and ethical concerns. Helping the public understand the use of cadavers and starting the discussion about death and the products of death can only benefit the community and may increase the donor pool once the public understands all of the various uses and benefits from the use of the dead.

Recommendations for Further Research

Recommendations for future research emerged from this study. The first is to conduct a survey of whole-body living donors to assess their knowledge or understanding of the potential uses of their bodies after death. This could also be used as an indicator on how the donor pool would react if they were fully informed to the potential use of their bodies. It would be interesting to see if there was a decrease or an increase in donation, as living donors would see the added benefit to the potential use of their cadaver. The second recommendation is to survey other whole-body donation programs to assess how other institutional officials account and mitigate for the unknown vectors of infectious disease when working with cadavers. These surveys could be used to gather the best management practices with exposure prevention to prions, tuberculosis, syphilis, MRSA or molds. As participants within this study indicated that this information was needed, this study would be valuable for institutional administrators working with the newly dead in clinical training or forensic anthropological research.

There were a number of unknown risks identified by the participants of this study (e.g., MRSA and prions). Additional research concerning these unknown risks is recommended. It would also be valuable to investigate whether infectious agents persist within an infected body after flushing the body with the disinfectant. This would involve flushing an infected body with the disinfectant and taking tissue samples to assess whether the vectors persisted within the body tissues after being treated. As the vector is assumed to be inactivated by the disinfectant agent in most cases but has not been scientifically proven, this study would provide valuable information in relation to using unembalmed bodies for clinical training.

Finally, it would be interesting to conduct additional research with communities surrounding facilities that use the newly dead. This could include surveys, interviews, focus groups and/or case studies. This could add to our understanding about public perception of what is believed to be a controversial practice.

Conclusions

Although work involving the newly dead may be viewed as gruesome, in reflection, the research and training that occur at Baltimore and Texas are necessary. As surgical instrumentation and techniques are developed, clinical training is necessary on the newly dead to provide society with skilled medical professionals. By providing this clinical training environment, not only do medical professionals learn and practice skills, but by offering this type of environment also reduces the use of the dead within hospitals who have not consented to having their bodies used for emergency medical training (DeVita, Wicclair, Swanson, Valenta, & Schold, 2003; Fourre, 2002; Iserson, 1993; Morag et al., 2005).

The research conducted at Texas State FACTS is necessary to understand the decomposition processes of human beings. The scientific information that is gained through these research projects expands the knowledge base, which is critical, as the public expects knowledgeable and trained public safety and law enforcement personnel. Although viewed as critical, the thought of a decomposition facility can be distasteful for those in the community. As such, strong leadership of decomposition facilities is essential, to not only attract donors, but to garner public support and acceptance of their facility.

Currently, language to describe the newly dead remains ambiguous, perhaps because of the aversion in western culture to engage in an open discussion about death and its immediate after-math. When the body is a person, when the body is quasi-property, and whether this definition is dependent on purpose of the body. From the participant interviews and the site-specific tours, the body definition does encompass both a person and property and is defined by purpose or use. In addition, a sub-theme emerged on semantics that are used to identify the body. The words chosen are also defined by purpose or use, and also by the audience listening to the word choice. From this research study, culture and traditions have influenced these word choices and on how the public regard cadavers, bodies, and death.

Findings suggest that institutional officials do perceive liabilities in working with the newly dead and have developed programs and processes to mitigate these risks. These perceptions are predicated on the individual's definition of risk. This definition is dependent on the education, professional judgment, the role the institutional official is playing within the issue, and the audience that is being addressed.

As a result of this study, it is evident that a well-developed, defined, and administered whole-body donation program that includes donor education and transparency in the use of cadavers needs to be in place for institutions interested in conducting clinical training and forensic research. These programs also need to have trained staff willing to assist grieving families and the next-of-kin to work through the donation process after their loved ones have died, and to also assist in their grieving process by fulfilling the deceased's last wishes.

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Appendix A

Interview Questions for Clinical Training

1. How long have you worked here? What drew you here? What is your background?
2. In general, please describe your program/facility?
3. Tell me about your office, who and what does your staff do?
4. What is the reporting structure of your organization? Who reports to whom, and why?
5. How do institutional officials perceive liability in regard to potentially ethically or politically charged research and education endeavors? How are these liabilities mitigated?
 - a. How does your body donation program work?
 - b. What pieces of the program do you believe need to be in place to ensure that all ethical concerns are addressed?
 - c. How have you used public relations? How are you using public relations to ensure that your program is well-received and to educate and inform the public, in addition to addressing any concerns?
 - d. Why do you think the use of cadavers is so controversial?
6. What safety and health considerations need to be addressed when allowing anthropological research and/or clinical training on the newly dead?
 - a. What are the main safety and health concerns you have experienced working with the unembalmed?
 - b. Can you explain how you mitigate any infectious disease or safety issues?

- c. How do you prepare for a clinical training involving unembalmed cadavers?
How are the bodies sanitized?
 - d. Do you conduct serological testing on cadavers? Do you request medical records?
 - e. What personal protective equipment is required for the preparer of the cadavers and for those attending the clinical training?
 - f. How do you mitigate the potential health issues of prions?
7. What ethical issues and legal considerations are of concern when using the newly dead and what programs and/or processes are put in place to mitigate these issues?
- a. What legal requirements do you follow in obtaining and using unembalmed cadavers?
 - b. What permitting requirements are you required to obtain for using the unembalmed, including sewer discharge of bodily fluids?
 - c. What documents, policies, and/or procedures should be in place for a clinical training program using unembalmed cadavers?
 - i. Did you mirror anyone when you wrote your policies, and if so, who?
What adaptations did you make?
 - d. What regulations are you following in order to stay in compliance with worker safety standards and public health expectations?
 - e. Have you ever been involved in a situation that gave you heartburn? How about sleepless nights? Please describe. What did you do?

Appendix B

Interview Questions for Anthropological Research

1. How long have you worked here? What drew you here? What is your background?
2. In general, please describe your program/facility?
3. Tell me about your office, who and what does your staff do?
4. What is the reporting structure of your organization? Who reports to whom, and why?
5. How do institutional officials perceive liability in regard to potentially ethically or politically charged research and education endeavors? How are these liabilities mitigated?
 - a. How does your body donation program work?
 - b. What pieces of the program do you believe need to be in place to ensure that all ethical concerns are addressed?
 - c. How have you used public relations? How are you using public relations to ensure that your program is well-received and to educate and inform the public, in addition to addressing any concerns?
 - d. Why do you think the use of cadavers is so controversial?
6. What safety and health considerations need to be addressed when allowing anthropological research and/or clinical training on the newly dead?
 - a. What are the main safety and health concerns you have experienced working with the unembalmed?
 - b. Can you explain how you mitigate any infectious disease or safety issues?
 - c. How do you prepare for research involving unembalmed cadavers?

- d. Do you serologically test your cadavers before implementing your experiments? Do you review medical records?
 - e. What personal protective equipment is required when conducting experiments at FACTS?
7. What ethical issues and legal considerations are of concern when using the newly dead and what programs and/or processes are put in place to mitigate these issues?
- a. What legal requirements do you follow in obtaining and using unembalmed cadavers?
 - b. What documents, policies, and/or procedures should be in place for a clinical training program using unembalmed cadavers?
 - i. Did you mirror anyone when you wrote your policies, and if so, who?
What adaptations did you make?
 - c. What regulations are you following in order to stay in compliance with worker safety standards and public health expectations?
 - d. What types of permits did you need for the construction of the FACTS facility? How about storm water concerns?
 - e. Have you ever been involved in a situation that gave you heartburn? How about sleepless nights? Please describe. What did you do?

Appendix C



**Certification of Approval for New Protocol: Social Behavioral
Social Behavioral Institutional Review Board**

Date: December 13, 2011
To: Janet Usinger, PhD College of Education
Copy: Stephanie Woolf

UNR Protocol Number: S12-051
Protocol Title: How Institutional Officers Perceive the Safety, Legal, and Ethical Liabilities
Regarding the Use of the Newly Dead for Clinical Training and Forensic
Research
Type of Review: Expedited 7
Approval Period: December 13, 2011 to December 12, 2012

This approval is for:

SKMBT_6001112313140.pdf (Site approval), SKMBT_6001112313133.pdf (Questionnaires),
SKMBT_6001112313131.pdf (Recruitment materials), SKMBT_6001112313130.pdf (Suppl, exp
review checklist), usinger 12 9 2011 RevRpt_Exp2 send to PI.rtf (IRB Review Report), Woolf -
Dissertation IRB Expedited Application_ju.docx (Protocol application),
Social_Behavioral_Consent_Template_Woolf_111511.doc (Consent Form), Recruitment email.docx
(Recruitment materials)

Approved number of subjects: 15

The above-referenced protocol was reviewed and approved by one of UNR's Institutional Review Boards
in accordance with the requirements of the Code of Federal Regulations on the Protection of Human
Subjects (45 CFR 46 and 21 CFR 50 and 56).

PI Responsibilities

- Maintain an accurate and complete protocol file.
- Submit continuing projects for review and approval prior to the expiration date.
- Submit proposed changes for review and approval prior to initiation, except when necessary to eliminate apparent immediate hazards to subjects. Such exceptions must be reported to the IRB at once.
- Report any unanticipated problems which may increase risks to human subjects or unanticipated adverse events to the IRB within 5 days.
- Submit a closure request 10 days after project completion to the IRB.

Reference the protocol number on all related correspondence with the IRB. If you have any questions,
please contact Nancy Moody at 775.327.2368.

For Veteran's Administration research only

VA Research: No
Flag VA Medical Record: No