



CADAVERS: TOUCHING LIVES AFTER DEATH

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Dissecting cadavers is a vital part of educating health professionals. Unlike a book or computer program, learning with cadavers exposes students to the three-dimensionality of the human body. The uniqueness students observe in each



cadaver is representative of the diversity they will encounter in their patients. While the benefits of cadaver dissections are well known and well documented (Dempster et al. 2006), this experience may prove to be one that evokes emotional reflection (Robbins et al. 2008).

In 2005 Lempp conducted a survey with British medical students that assessed their views and feelings on cadaver dissection. Of the students surveyed, he found that many of the students were apprehensive about their work with the cadavers. Some raised concerns about coming in contact with certain diseases, such as AIDS/HIV, and bacterial or other viral infections. However, the majority of the students felt that their work with cadavers was an essential part of medical school, which aided them in their learning experience. Furthermore, the students felt that their training with the cadavers prepared them for their education in the years following medical school. Through cadaver dissection, students understand the relationships, textures, shapes, and structures of the organs.

Over the past several years, we have found that most students do not exhibit emotional hardship but rather have a positive experience in the anatomy lab. Reflecting on our experiences, as well as those of teaching assistants and students, we have identified three repeating themes within comments and discussions regarding the anatomy lab. Those themes include the opportunity for personal insight, team building and career building possibilities.

Personal Insight

I walked into the frigid lab and a pungent and penetrating smell permeated the room. Naive of the cadavers that lay beyond the immense metal doors to my left, I expected a didactic lab using plastic bones and diagrams. While listening attentively to my professor pour over the syllabus, I abruptly comprehended—this course was cadaver-based! I had never had contact with death prior to this experience; my immediate

family and relatives were all alive and well. Funerals were still a foreign concept to me.

Teaching assistants began rolling out gurneys with full body bags lying upon them. I concluded if I was going to do well in this lab, I could not be intimidated; allowing myself to feel timid and fearful would only impede my learning. I quickly grabbed some gloves and then approached a body. Though the cadaver that lay before me was completely lifeless and listless, the sight of it did not distress me. As I explored further, I noticed the body had polished nails and a faint tattoo on her shoulder. This led me to wonder what she was doing just before she passed. Did she have a granddaughter that polished her nails? Was she spending time with her family? Could she have been reading? My first cadaver came to life instantly. She was more than a specimen I was using to learn anatomy. She was my first patient, who taught me the structures that support human life (Natalie Kzirian).

For a portion of the population, the mention of the word “cadaver” causes trepidation and discomfort. Fear of vulnerability, death, chemical smells, and physical symptoms such as vomiting or fainting fill their minds. Others students are excited, curious and elated. “I wanted so badly to really understand and see what lies below my skin, what I’m really made of,” a student notes. No matter what feelings a student exhibits, positive or negative, the common factor is that each of them is consciously feeling something. It is through this rare educational moment that students are given the opportunity to open up to vulnerability. One student exclaims that the experience of seeing a cadaver is “equal to that of a roller coaster ride or having a baby: I don’t know if I should scream, cry, or happily sit there in awe.” But as stated earlier, the range of emotions felt by each individual is clearly unique, which is exemplified by another student who describes the encounter in a more unsettling light: “I have silly thoughts of the cadavers coming back to life or imagining it was my body. It’s creepy.”

Although there are varying first experiences, students soon begin to understand the increased potential to gain knowledge from the privilege of viewing cadavers in the labo-

ratory. Charrie McFadden, a former lab student and current teaching assistant in the laboratory, describes her experience:

I remember the first time I saw a human cadaver. Seeing a human heart and a human brain for the first time - it was so exciting. I distinctly remember seeing the sciatic nerve and the sheer thickness of it just blew my mind. For me, it was better than anything I had ever witnessed before, including the Human Body exhibit I visited at the Detroit Science Center. I am so honored for the chance to be working with the human cadavers and I wouldn't trade this experience for anything.

For other students, it may take longer to gain enthusiasm and excitement when viewing and utilizing the cadavers. A student describes her reaction after seeing a cadaver for the first time, "I was very apprehensive to go near it. I was overwhelmed with the fact that these cadavers were once live human beings, and I had to learn how to desensitize myself in order to achieve the scientific learning experience."

Detachment is one way that some students cope with the experience. Drawing the student's attention to the academic task at hand can provide distraction and aid in establishing some detachment. For example, we found students tend to become more at ease once they begin to focus on learning anatomical structures rather than their own feelings. Students concentrating on learning the origin, insertion, action and innervation of each muscle in the upper limb tend to stop thinking about death and their other fears. Teaching assistants can help students make this transition. While detachment often helps with easing the emotional disturbance, students must always maintain a level of respect and honor for the cadaver. Disregarding human life is not the goal here, but a certain level of emotional detachment is necessary in order to establish a balance between empathy and a scientific and academic attitude.

From observations of Fox (1979) at Cornell Medical School in the 1950s, medical students developed a 'scientific' attitude by successfully managing their distress in the dissec-

tion laboratory. An attitude called “detached concern” allows students to maintain a balance between caring and detachment, which is important to psychological well-being in clinical practice. Students tend to go through stages of dealing with the cadaver to ultimately attain a scientific attitude toward working with cadavers (Fox, 1979; Kennedy & Olson, 2009).

The stages of working with a cadaver are described by a student comparing her first day in the anatomy laboratory and her change in perception halfway through the semester:

The first time the cadaver was presented to the class I was very uneasy. I was hoping to pass the class without touching or being around the cadaver. The smell of formalin made the experience worse. A classmate advised that I take a deep breath to get it over with. However, after a couple weeks, I have grown to understand more than I expected. I am able to differentiate muscles, nerves, arteries, and veins. This course is more productive to me than expected.

On the first day of cadaver lab, 49% of students felt apprehensive, nervous or uneasy. However, by mid-semester, students’ perceptions began to transform and the students started to feel a sense of gratitude toward the cadavers for, in a sense, “teaching” them anatomy. This is a custom that is honored all over the world. For example, in Thai schools and universities, the respect is formalized in a ceremony called wikhru (honor the teacher), which takes place annually. One student stated that she came to respect the cadavers even more than the living teachers (Winkelmann & Guldner, 2004). The students are taught to have respect and the highest regard for cadavers and understand that these cadavers wanted to assist them in learning anatomy in order to ultimately help others in medical need.

After understanding the benefit of using the cadavers as teachers and attaining detached concern, the students perceive the laboratory in a more intuitive manner. Leung et al. (2006) state that with a well-designed curriculum and a dedi-

cated faculty, the anatomy laboratory can be a place for nurturing humanistic values and end-of-life attitudes.

As the semester progresses, students even begin to change their perception on donating their own bodies. In the beginning of the semester, the majority of students disagreed or strongly disagreed with the idea of donating their bodies to science. However, by mid-semester, there was a shift in students' attitude toward donating their bodies; more students felt neutral or agreed to donate their bodies after appreciating the knowledge they gained from their cadavers. This is just one of the ways cadavers have affected students in their life decisions outside of the laboratory.

One student stated her feelings on utilizing cadavers: "It sort of freaks me out but I think a good way of looking at it is these people donate their bodies to science. They want you to cut and study them. I think it is important to be respectful and appreciate people who are willing to donate their bodies." Without cadavers in the laboratory, most students would not think about respecting the dead while learning anatomy. Death is an event that all health professionals must learn to handle both emotionally and professionally. Early exposure to issues of death with the guidance of faculty can help students develop positive coping mechanisms and attitudes toward dying. It is a venue to deliver personal values and death education (Leung et al., 2006). Gunderman & Wilson (2005) also agree and state that "working with a lifeless human form day after day for months on end, students develop a clearer sense of what it means to be alive, and an appreciation for that vast chasm that separates life from death." The majority of anatomy students felt neutral or agreed that utilizing cadavers would improve their attitude toward death (Figure 1).

Although students spend countless hours reading their anatomy textbooks and studying plastic bones and models, they are gaining humanistic values that cannot be taught in a traditional sense but rather are gained through experience. It is through the anatomy lab that students gain personal insight

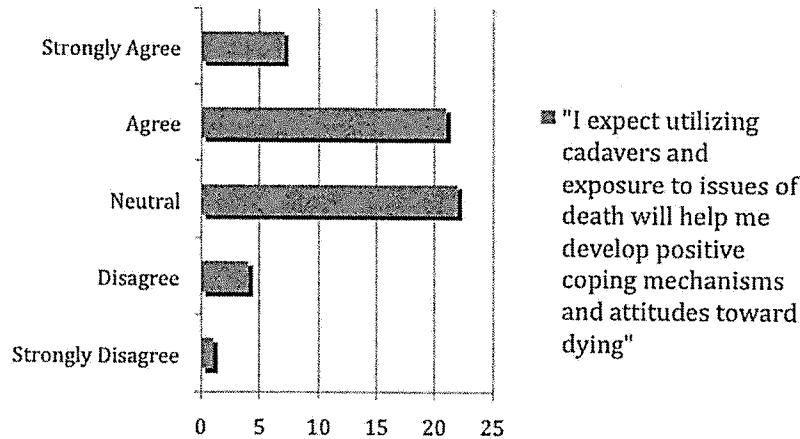


Figure 1. Students strongly agree, agree, feel neutral, disagree or strongly disagree about the experience of utilizing cadavers and its resulting impact on their anticipation of having developed positive attitudes and coping mechanisms, n=55.

regarding their ability to balance their emotions and professionalism with reference to the end of life.

Team Building

“I have been attending Oakland University for two and a half years now. I’m a commuter, a full-time student, and have a part-time job off campus. I’m in the health sciences but haven’t picked my exact career yet. My experience in the anatomy laboratory taught me something most people probably don’t think about.

The first day of class the instructor explained the syllabus and talked about the bones. Then she told us to practice them together and quiz each other. I was sitting at a big table with five people and a set of bones. I hated working with other people in groups. Usually someone doesn’t do what they are supposed to do, or someone with a bad idea takes charge. I am not confident about sharing my ideas with other people so I usually just go along with whatever someone else suggests.

When I realized we would be working in groups every class, I really felt like dropping the course.

When we began the first dissection, we started talking about family members and other people we knew who died. We were all nervous about making a mistake during the dissection. Our experience with the cadaver really gave us all a common ground. We all learned together and helped each other. I can firmly state that it wasn't until I took this course that I felt like a real member of the university community. Working in this group helped me to study for the exams. I believe we became friends because we had to dissect together, and that made the course easier" (anonymous student).

The team interaction in the anatomy laboratory has proved to advance student learning ability and comfort level around the cadavers. Korf et al. (2008) to explain that anatomy laboratory teaches the basic language of medicine as well as some manual dexterity. The laboratory introduces an understanding of the multiple dimensions of the body and the realistic concept of biological variation. Furthermore, interactions that occur in the anatomy laboratory introduce students to working within a team. This fosters communication skills and acclimatizes students to the reality of death all while teaching respect for the body (Korf et al., 2008).

Not only are students working with the professor and teaching assistants but also they are also interacting with their peers, standing alongside them viewing or dissecting the cadaver. In the two hundred and twenty students we surveyed, not one student felt working in teams or groups was a disadvantage. Sixty percent of students agreed and forty percent of students strongly agreed that learning in small groups and interacting with their peers enhanced their ability to learn anatomy. Students perceive that their peers assisted them in improving their education in anatomy. We also found that the majority of students prefer the team-based learning environment relative to independent study while studying cadavers (Figure 2).

Jayne Jackson, a former anatomy laboratory student and

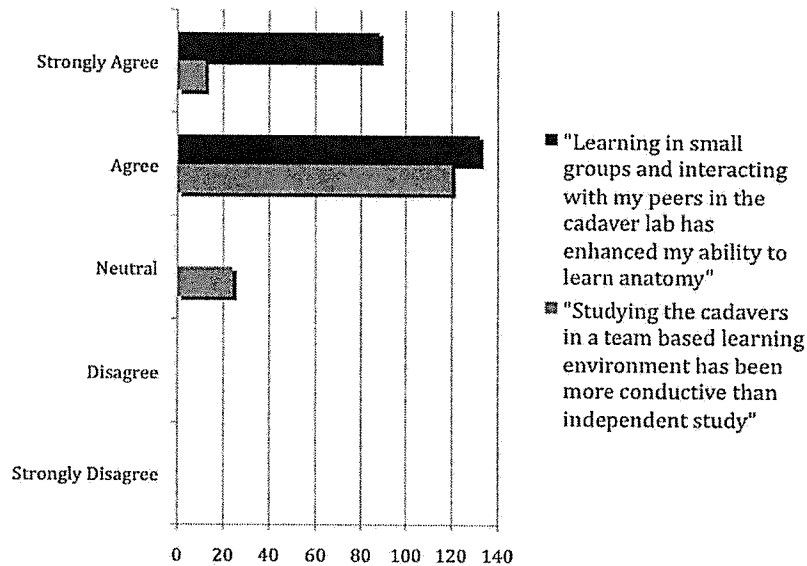


Figure 2. Students strongly agree, agree, feel neutral, disagree or strongly disagree about working in small groups and the positive impact of team-based learning in the cadaver lab, n=212.

current teaching assistant, comments on working and teaching in a group setting:

I absolutely love working with the cadavers. Assisting students in learning anatomy has allowed to me learn how to work with multiple personality types and how to teach in different ways. Not every person learns the same way and in the laboratory I get the opportunity to experiment with different ways of explaining anatomical structures. I love teaching in a hands-on manner, especially when teaching the blood flow of the heart. I start with the right atrium and have the students pass around the heart identifying the valves and structures that the blood flows through until it reaches the aorta and is transported to the rest of the body.

Students interact with each other to share different perspectives on learning anatomy. Steven Phillips, a former

anatomy laboratory student and now teaching assistant in the anatomy laboratory, shares his experience handling the cadaver:

After being in the anatomy laboratory and seeing the cadavers, I cannot imagine understanding and learning anatomy to the full extent without them. Talking with friends and family that have taken anatomy before without a cadaver laboratory really puts in perspective the importance of having a human body to learn from. The availability for the students to handle the cadavers is also a huge bonus. I will never forget the second day of class in the laboratory when a teaching assistant asked me to pull on the flexor digitorum superficialis muscle and I saw the fingertips curl inward toward the palm. That to me was an eye opening experience. Ever since then, I can determine a muscle's action just by looking at the origin and insertion. If it weren't for the BIO 206 cadaver laboratory, I would still be forced to memorize all of these muscles off of a sheet instead of visualizing and understanding them. To me, the experience I had in BIO 206 was priceless, and I feel that it was the most informative.

Another teaching assistant also agrees about the benefits of the laboratory setting:

I love working with the students and using the human cadaver to do this. It makes their understanding of the laboratory so much easier and much more attainable. Most students are not all that gung-ho about the cadavers at first, but the end result is that most of the students appreciate and come to recognize the privilege of being able to work with a human cadaver and not just pictures and models like most other laboratories in the United States.

Team building is crucial to our students' social development. In an academic setting, we shape students' knowledge and understanding of many different subjects. However, an important part of their careers will be to communicate with their patients and interact with a team of professionals. This is another aspect of education that faculty should work to de-

velop. Imparting the opportunity and helping to refine interaction skills in our students have a positive impact, which is vital for their success as future health practitioners.

Career Building

As I walked through the trauma center at the downtown hospital I was volunteering at, a shrill alarm sounded. Physicians and residents quickly emerged, rushing toward the trauma bay. A patient experiencing chest pain and difficulty breathing had lost consciousness and entered cardiac arrest. Her EKG confirmed uncoordinated contractions of her heart, and indicated ventricular fibrillation. A resident brought the CPR machine to help give chest compressions, but the team quickly realized it was broken. A second CPR machine was discovered to have dead batteries, and action was required. One by one, each of the physicians, residents and nurses performed compressions until they fatigued, and finally I was asked to participate. I was honored and amazed to have the patient's life in my hands. As I meticulously compressed her chest, I remembered the enlarged heart I had dissected in cadaver laboratory only a week prior. In laboratory, I had cut into each chamber of the organ and was impressed at how they all functioned in perfect concert. But this patient's heart must not have read my Netter anatomy text and was beating at a rhythm of its own.

Her heart rhythm rotated from normal to arrhythmia for the next half hour, taking me on a roller coaster of emotions. I was thrilled when she seemed to recover but quickly frustrated when she returned to crashing. Everyone in the trauma room diligently worked to get her heart back to normal and stabilized. Unfortunately, despite our efforts, she died of cardiac arrest. As I assisted in moving her body for post-mortem care, I could not help but think how my experience in the laboratory had assisted my ability to deal with death ((Natalie Kzirian).

Anatomy is a very living and modern subject and a unique experience in the undergraduate and graduate science curriculum. For many, it is the first glimpse of the structures they will work with in their professional career and in it students re-

ceive the opportunity to develop into the clinicians they desire to someday become.

Charrie McFadden describes how the laboratory gave her a different perspective on her career ambitions: "I would love to go into the surgical field and without the experience of working with a human cadaver, I wouldn't have an inkling as to what that might be like." Alison Gilinski, another former laboratory student and current teaching assistant, also describes her experience:

I still cannot help but marvel at the knots of nerves and jumbles of muscles that transform a person's shell into a fully-functioning human being. Working with cadavers has further magnified my appreciation for the value of human life and makes me excited to attain a career in medicine where I will continually learn new things about the human body each day.

Another student notes that the experience students gain from the anatomy laboratory helps to direct their career paths: "When I saw the cadaver for the first time and all the organs lying beneath the skin and bone, I just knew that I wanted to be a surgeon." However, not all students are drawn to the surgery or even the medical field by their experience. Another student explains, "Being a doctor sounds so wonderful, but I realize now I don't want to spend my days with blood and guts. I'm glad I had this experience because now I'm more certain than ever that I want to be a hospital administrator and not the person holding the scalpel."

This shows that students learn much more than a simple understanding of the intricacies of the human body, and all that they learn helps in guiding them to their desired career. Their time spent in the anatomy laboratory also reminds them of the softer side of future "doctoring," including having empathy, care, and respect. One student notes, "It was through my experience in the cadaver laboratory, that I came to learn about how important having a sense of compassion is to any health profession."

In closing, the students' experiences in the cadaver laboratory are extraordinary. Such experiences allow them the opportunity for self-realization, and help guide them in their career decisions, while connecting them with their colleagues as team members. Their experiences in the anatomy laboratory provide a unique opportunity to build a strong foundation personally, socially, and intellectually.

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