

Medical Students' Reactions to Anatomic Dissection and the Phenomenon of Cadaver Naming

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The teaching of gross anatomy has, for centuries, relied on the dissection of human cadavers, and this formative experience is known to evoke strong emotional responses. The authors hypothesized that the phenomenon of cadaver naming is a coping mechanism used by medical students and that it correlates with other attitudes about dissection and body donation. The authors developed a 33-question electronic survey to which 1,156 medical students at 12 medical schools in the United States voluntarily responded (November 2011–March 2012). They also surveyed course directors from each institution regarding their curricula and their observations of students' coping mechanisms. The majority of students (574, 67.8%) named their cadaver. Students most commonly cited the cadaver's age as the reason they chose a particular name for the cadaver. A minority of the students who did not name the cadaver reported finding the practice of naming disrespectful. Almost all students indicated that they would have liked to know more about their donor, particularly his or her medical history. Finally, students who knew the birth name of the donor used it less frequently than predicted. The authors found that the practice of naming cadavers is extremely prevalent among medical students and that inventive naming serves as a beneficial coping mechanism. The authors suggest that developing a method of providing students with more information about their cadaver while protecting the anonymity of the donor and family would be useful. *Anat Sci Educ* 7: 169–180. © 2013 American Association of Anatomists.

Key words: gross anatomy education; medical education; laboratory dissection; medical students; cadaver naming; medical humanities; coping mechanisms; medical professionalism

INTRODUCTION

Teaching gross anatomy to medical students has, for centuries, relied on the dissection of human cadavers. Although

medical science has vastly changed since the first cadavers were dissected, and anatomical dissection has been the subject of myriad controversies, the dissection of a human cadaver has endured as a formative experience for students entering medicine.

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Medical Students and Reactions to Dissection

Each fall, first-year medical students enter the gross anatomy laboratory for the first time. At the unveiling of their cadaver, students naturally ask the question, "Who is/was this person?" Gross anatomy course directors traditionally give only a partial answer, providing limited information from the donor's death certificate such as age, occupation, and cause of death. They withhold other identifying and personal

information, ensuring anonymity for the donor and the donor's family. However, students have frequently expressed a desire to have a closer relationship with the body donor and to know more information about the person who gave their body for dissection (Bohl et al., 2011).

In response, several medical schools have broken this norm in an attempt to encourage students to acknowledge the personhood of their cadaver. In some laboratories, students are provided with the birth name of their body donor and occasionally have an opportunity to meet with the donor's family (Crow et al., 2012; Maron, 2012). Establishing a potential relationship between acknowledgment of the cadaver's humanity and academic achievement, Talarico (2013) demonstrated an increase in students' scores on the National Board of Medical Examiners[®] (NBME[®]) Gross Anatomy and Embryology Subject Examination when the body donor's name is provided. Additionally, when surveyed, most medical students (74%, $n = 224$) and body donors (81%, $n = 54$) support a novel program in which students would be given the opportunity to view a recorded interview with the body donor before death, further illuminating the donor's otherwise-absent personality (Bohl et al., 2013).

Although there are limited data on the impact of providing students with more complete information about their cadaver, several authors have documented the characteristic emotional progression of students as they face cadaveric dissection (Francis and Lewis, 2001). Most medical students approach dissection with feelings of shock and discomfort, but by the end of the course "they could even study a prosection while munching on a sandwich," (Lella and Pawluch, 1988). This radical shift in emotional reaction has led many authors to describe the process of dissection as a way to equip medical students with the emotional skills that they will eventually use when working with their future patients (Arráz-Aybar et al., 2008; Redwood and Townsend, 2011). Swartz (2006) equates these skills with medical professionalism and because of the respect required when working with cadavers and the large amount of hands-on time spent with classmates and faculty, suggests the gross anatomy laboratory as the site for the first evaluation of students' professionalism.

Some authors have suspected that the cognitive stress related to learning hundreds of anatomic terms compounds the emotional stress associated with the dissection of an actual human body (Becker, 1977; Dyer and Thorndike, 2000), while others have postulated that the simple anticipation of dissection is the cause of the majority of students' stress (Becker, 1977). Accounts from those who have dissected, however, describe that dissection of a cadaver induces stress even after the disorienting "first cut," (Roach, 2004; Montross, 2007). Regardless of the causes of the stress reaction, medical students use psychological coping mechanisms throughout the process of dissection. Despite the well-documented emotional progression, relatively few studies have examined the specific reactive coping mechanisms used by students during dissection.

Historically, one of the ways students coped with the psychological stressors of dissection was via "cadaver antics," which included making jokes, assigning distasteful nicknames to cadavers, removing body parts from the laboratory, and pulling pranks to scare classmates (Hafferty, 1988). This coping mechanism represents gallows humor, which allowed students to infuse wit and comedy into the emotionally difficult task of dissection (Freud, 1960). Within the past 50 years,

however, anatomy course directors have begun to encourage respect, empathy, and compassion toward the cadaver and acknowledgment of the donor's humanity. In this new context, students have continued to use other psychological coping mechanisms during dissection. Lella and Pawluch (1988) grouped the many coping mechanisms students use into two main categories: objectification of the cadaver as simply a specimen to be studied; and rationalization of the experience of dissection as a crucial step in the education of physicians. Fleischmann (2002) examined coping mechanisms used by individuals working in a biomechanics laboratory and grouped them into three main categories: task-focused, in which individuals attempt to ignore the humanity of the donor by becoming engrossed in the dissection; emotion-focused, in which individuals have a connection to or fascination with the body donor; and avoidance-focused in which individuals exhibit denial about the personhood of the donor. Summarily, those who dissect cadavers use disparate coping mechanisms to accomplish the educational goals set out for the process.

In addition to exploring how coping mechanisms contribute to students' recognition of the donor's humanity, the ways in which medical students relate to their cadavers have also been explored. Weeks et al. (1995) discuss the usage of simply changing the terminology used to refer to the deceased body, suggesting that "donor" has a more positive connotation than "cadaver" or "corpse." Cultural differences also affect how medical schools encourage students to view cadavers in ways that engender respect. American medical students are often encouraged to approach the cadaver as a first patient, whereas in Thailand cadavers are regarded as "ajarn yai," or "great teachers," a highly regarded status in Thai culture (Penney, 1985; Winklemann and Güldner, 2004). Bohl et al. (2011) found that students' perception of the cadaver as a teacher actually increased both respect for and empathy toward the cadaver when compared to the perception of the body donor as the students' first patient; they suggest that an introduction of the cadaver as teacher would further support students' desires for a closer relationship with the donor.

The Naming of Cadavers

The focus on respect and compassion toward donated cadavers has led to a decrease in cadaver antics, yet the practice of medical students naming their cadavers has persisted. From 19th century diaries to modern-day creative writing, medical students have documented this practice in describing their reactions to dissection. These authors often recount the exact name that was assigned to their cadaver and others by the laboratory dissection groups (Mukand, 1994; Roach, 2004). Despite the prevalence of cadaver naming, some medical students do not name the cadaver and several course directors specifically prohibit students from naming cadavers (Yurkievicz, 2011). Discussions with students who personally advocate against the practice of naming and those at medical schools where naming is prohibited reveal that a major reason for this position is an attempt to bolster respect for the body donor. Students and faculty, alike, cite that the body donor already had a name so assigning a new name may be inherently disrespectful, especially if the name can in any way be perceived as uncouth. The literature on medical professionalism in gross anatomy, however, does not explore this topic directly.

In her memoir about the dissection experience, Montross (2008) recounts her personal struggle with the naming process:

The idea of [naming] struck me as disrespectful, and I was sure that I would resist if my lab partners suggested a name for our body.... I am surprised when the name we give our cadaver emerges so organically that I do not even resist it. In fact, I embrace it.

When we first remove the damp cloth over her abdomen, the skin is set in firm, deep creases, so we do not notice right away that she has no um bilicus.... "What kinds of things lead to no belly button?" Silence.

"Maybe we got Eve." (Montross, 2008)

Despite its longevity, controversy, and public interest in the phenomenon, cadaver naming is surprisingly ignored in the literature with the exception of anecdotal accounts. We sought to address this paucity of research on cadaver naming by studying the related views and experiences of medical students and anatomy faculty. We hypothesized that the naming of cadavers represents one of many coping mechanisms used by medical students during dissection and that the decision to name or not name the cadaver correlates with other coping mechanisms and attitudes about anatomic dissection.

METHODS

A cross-sectional, nonvalidated 33-question electronic questionnaire was developed directed at medical students' experiences in the gross anatomy laboratory (Appendix). The progressive logic questionnaire also contained subsections presented to students who were assigned to several cadavers during their laboratory course and for students who were told the birth name of the donor before the dissection. The Drexel University College of Medicine Institutional Review Board approved the survey in November 2011.

Faculty at 20 allopathic and osteopathic medical schools in the United States, five in each of the four geographical quadrants, were contacted and asked to distribute an online survey link to their students who had completed the gross anatomy laboratory course. Medical schools were chosen either at random or because one of the authors had a professional contact at the institution. Twelve of these schools agreed to distribute the survey and students voluntarily completed the online questionnaire. Data were collected between November 2011 and March 2012 using Google's survey software.

Based on their dissection experience, students' responses were grouped into the following three groups for analysis: (1) students who were told the donor's birth name before dissection; (2) students who were not told the donor's birth name, but were assigned to several cadavers during the course of the dissection; and (3) students who were not told the birth name of the donor and were assigned to only one cadaver for the dissection. Students were also grouped by age at the time of dissection and then into traditional medical students (24 years old and younger) and nontraditional medical students (25 years old and older). Demographics of the respondents were compared with demographics of matriculated medical students published in the FACTS database by the Association of American Medical Colleges (AAMC, 2011).

The answers to free response questions were grouped into categories based on themes when appropriate. The names

given to cadavers were grouped according to the reasons students cited for choosing the name, and each name was included in up to two of the groups.

Data were analyzed using SPSS Statistics, version 20 (IBM Corp., Armonk, NY). Descriptive statistics and comparisons between those who named and those who did not name the cadaver (using χ^2 analyses and independent-samples *t*-tests where appropriate) were performed and analyzed.

Finally, course directors of gross anatomy at respondents' medical schools were also contacted to gather further information regarding students' dissection experiences at these institutions. Course directors were asked whether their curricula included predissection discussions with students, whether they address the topic of naming of cadavers with their students in any way, and for their estimate of the percentage of their student body that names their cadavers.

RESULTS

A total of 1,152 medical students from 12 medical schools voluntarily responded to the survey; the institutional response rate ranged from 9% to 25%. Of the respondents, 847 students (73%) were in a traditional gross anatomy laboratory in which they were assigned to one cadaver and were not told the donor's birth name; 255 students (22%) were told the birth name of their single donor; and 50 students (4%) were assigned to multiple cadavers but were not told the birth name. Table 1 summarizes the demographics of the survey respondents. When compared with 2011 AAMC data, survey respondents included a significantly greater percentage of women than the national sample ($\chi^2 = 44.62$; $P < 0.001$) and differed in complex ways on race ($\chi^2 = 29.72$; $P < 0.001$). Religions covered a wide range; about 25% of respondents expressed atheist or agnostic views, but a substantial percentage were Christians, Jews, Muslims, and adherents of Asian religions. We found no data on religion from the AAMC for comparison.

Decision to Name the Cadaver

Of the students in a traditional gross anatomy laboratory, 67.8% (574) were in a group that chose to assign a name to the cadaver. Table 2 summarizes the reasons students cited for assigning particular names to their cadavers and offers representative names for each category. Students most frequently cited the age of the cadaver to explain the name they selected (21.2%). Most students who named their cadaver stated they would not change their naming behavior; 85% (488) indicated that, if given the opportunity, they would name a subsequent cadaver. Conversely, 15% (86) would change their behavior and would not name a subsequent cadaver.

When asked about the timing of the naming process, 87% (499) of students were in groups that assigned a name to their cadaver within the first two weeks of the dissection. There was a significant association between the time during the dissection when the cadaver was named and the total time spent dissecting; students who named during the middle or end of the dissection had a longer mean dissection time than those who named at the beginning (19.5 weeks vs. 15.6 weeks, $t = 3.505$; $P = 0.001$). One-fifth of respondents (114, 19.9%) indicated that they were the ones to initiate the

Table 1.

Survey Participants' Demographics and Comparison with the National AAMC Database

Demographics	Survey, ^a n (%)	AAMC, ^b n (%)	χ^2	P value
Sex				
Male	494 (42.8)	10,192 (53.0)	44.62	< 0.001
Female	658 (57.2)	9,038 (47.0)		
Race				
Asian	230 (19.9)	17,772 (22.7)	29.72	< 0.001
Black	68 (5.9)	5,581 (7.1)		
Latino	61 (5.3)	6,159 (7.9)		
White	772 (66.8)	47,906 (61.1)		
Other	24 (2.1)	924 (1.2)		
Religion		NA	NA	NA
Agnostic	172 (14.9)			
Atheist	126 (10.9)			
Buddhist/Taoist	22 (1.9)			
Christian—Catholic	207 (18.0)			
Christian—Protestant	264 (23.0)			
Hindu	44 (3.8)			
Jewish	119 (10.4)			
Muslim	38 (3.3)			
Spiritual, but not religious	109 (9.5)			
Other	50 (4.3)			
Age at dissection (years, mean \pm SD)	24.2 \pm 2.6	24.0	NA	NA

^aData from 1,152 medical students at 12 United States medical schools (November 2011–March 2012) who had completed gross anatomy course.

^bDemographics of matriculated medical students published in the FACTS database by the Association of American Medical Colleges (AAMC, 2011).

naming process, whereas 6.9% (40) of students objected to naming but did not make their feelings known to the group. A minority of these objecting students eventually used the name the group assigned to the cadaver.

Decision Not to Name the Cadaver

Of students in a traditional gross anatomy laboratory, 32.2% (273) were in groups that chose not to name their cadaver, citing many reasons (Fig. 1). Most commonly, students reported they were simply not inspired to name (123, 45%). The free text responses grouped into this category included individuals who felt ambivalent about naming and those for whom the topic never came up. Another group of students acknowledged having a conversation about naming, but the conversation did not result in a durable name (55, 20%). These two groups together (65% of those who did not name) represent students who did not have particular objections to naming. However, about one-third (96, 35%) of students who did not name their cadaver did feel the practice of naming is in some way disrespectful; several referred to the fact that the donor already had a name in life. When asked, 14.7% (40) of students in groups that did not name indicated that it was their personal objection that influenced the group not to name the

cadaver. Therefore, in total, 11.3% (96) of all survey respondents did not name because they had an objection to naming.

Only 6.3% (17) of those who did not name the cadaver would change their behavior and name a subsequent cadaver. This small number of students represents a significant difference in the desire to name a subsequent cadaver between the groups who named (488, 85%) and groups who did not name ($\chi^2 = 393.7$; $P < 0.001$).

Differences Between Those Who Named and Those Who Did Not Name

Table 3 summarizes the responses of students in a traditional anatomy laboratory to questions about factors that impacted their dissection experience (e.g., laboratory group size) and their postdissection views related to body donors and future dissection. The median reported dissection group size was six students (range two to eight students), with students who did not name their cadavers more likely to have been in a smaller dissection group (5.2 vs. 5.8 students, $P < 0.001$). Students who named their cadaver, on average, spent a longer amount of time on the dissection (18.9 vs. 15.5 weeks, $P < 0.001$). There was no difference in the percent of the dissection students reported to have personally completed (27.3% vs. 29.2%, $P = 0.126$).

Table 2.

Choosing a Name for the Cadaver

Theme and name given to cadaver	Specific reason	Frequency (%)
Related to age		21.1
Ethel	An old lady's name	
Melvin	Suited our cadaver's grandfatherly appearance	
Pearl	Nice name for an older lady	
The name "just fit"		16.3
I do not remember reason		15.8
Related to a physical characteristic		14.4
Frank the Tank	He was huge	
Melanie	She had moles, so we assumed she had melanoma	
Tough Old Broad	She had survived a lot in life based on her scars	
Nickname		7.4
A Wrinkle in Time	His skin was very wrinkled	
Abracadaver	Generalized friendly name	
Buddy	He seemed like a cool guy	
Friend		
Thrasher		
To show respect/formal address		7.4
Mr. Jenkinson	Seemed like a distinguished gentleman	
Mrs. Robinson	Her fingernails were painted bright pink, so she must have been a cool old lady like the song	
Our Fair Lady	Another human name would be disrespectful	
Pop culture reference		6.5
Alice	Getting lost down the "rabbit holes" of the neck	
Estelle	She reminded us of the character from "The Golden Girls"	
Sallie Mae	Our student loans	
Tin Man	He had a big heart	
Waldo	We were always searching for something inside him	
Related to cadaver's tattoo		4.2
Colonel	Military tattoo	
Deener	He had a DNR tattoo on his chest	
Sir Jameson	His tattoos of scotch and soda	
I do not remember name		3.0
Related to occupation		2.1
Astro	Astronomer	
Bruce the Sailor	He was in the Navy	
The Chemist		
Philosophical reason		1.4
Ernest	We worked earnestly hard on him	
Eve	Our first patient	
Zeus	The god-like gift he gave us	
Related to cause of death		0.5
Neo	He died of a neoplasm	
Weezy	He died of respiratory failure	

Data from 574 medical students at 12 United States medical schools (November 2011–March 2012) who had completed a gross anatomy course and chose to name their cadaver. The reasons cited in free-response answers for why the specific name was chosen for the cadaver were grouped thematically. Representative names for each category are included along with the specific reason given.

A significant correlation was found between a student's time thinking about the body donor's life story and the choice to name the cadaver. Students who named their cadavers were significantly more likely to report that they often thought about the body donor's life during the course of the dissection, whereas those who did not name were significantly more likely to report that they rarely or never thought about it ($\chi^2 = 11.15$; $P = 0.001$). Students who named were also more likely than those who did not name to report that they remembered the color of their cadaver's eyes ($\chi^2 = 7.59$; $P = 0.006$).

Students responded to questions about whether they would support a family member's decision to donate their body for dissection, and whether they would donate their own bodies. More students reported they would support a family member's donation (45.8%) than would donate their own bodies (27.6%). A student's choice to name a cadaver did not have a correlation to these questions, and men and women were just as likely to indicate outright support or opposition for each decision ($\chi^2 = 2.354$; $P = 0.308$).

Medical students were also asked about their desire to know personal information about their body donor (Fig. 2). Students overwhelmingly said that they would want to know the donor's medical history (96.0%); the majority would be interested to know the donor's life story (72.6%). Fewer students would want to know the donor's birth name (47.7%) or to see a photo of the donor during life (35.7%). Within the group of respondents who did not name their cadaver, there was no difference in the rates of students wanting to know the donor's life story ($\chi^2 = 0.113$; $P = 0.737$); wanting to know the donor's birth name ($\chi^2 = 0.60$; $P = 0.807$); or wanting to see a photo of the donor during life ($\chi^2 = 0.113$; $P = 0.737$).

The only significant difference between medical schools is in the percentage of students naming their cadavers ($\chi^2 = 113.36$; $P < 0.001$). Specifically, 64.8% of the 142 respondents from one medical school reported not naming their cadavers, which is opposite the trend seen in other schools where the majority of students named their cadavers. There are also significant differences in naming when the respondents' specific religion was considered ($\chi^2 = 32.52$; $P = 0.001$). The outliers for whom naming rates differed from the overall trend included a notably greater percentage of Hindu respondents naming (31, 90.4%) and smaller percentages of both atheist (96, 59.3%) and agnostic students (132, 60.6%). The other religious groups did not differ from the overall rate of 66% naming. There are no differences in naming across students' racial groups ($\chi^2 = 7.61$; $P = 0.472$). Finally, there is no difference in the rate of naming between students who were assigned a cadaver of their same race and students who were assigned a cadaver of a dissimilar race ($\chi^2 = 0.495$; $P = 0.481$).

Use of the Assigned Name or Birth Name

When students who named were asked how often they actually used the name when referring to the cadaver, 66.5% (364) indicated that they did frequently. Of those who were told the birth name of the cadaver, 53.9% (137) actually used it, but a larger group (378, 69.0%) of those who did not know the donor's birth name indicated that they would use the name if they knew it. This difference between the actual and predicted use of the donors' birth names is statistically significant ($\chi^2 = 20.2$; $P < 0.001$).

Views of Gross Anatomy Course Directors

Gross anatomy course directors, like medical students, expressed varied opinions on the practice of naming cadavers. Some support the practice, citing tradition, and a means of "developing a relationship with the cadaver." Some faculties are indifferent to the practice, while others began providing students with their donor's first name to discourage potential disrespect caused by inventive naming. Course directors gave answers discordant with one another when asked to estimate the percentage of groups that assign names to their cadavers; responses ranged from 33% to 100%.

When asked about the main dissection coping mechanisms that they have observed students use, the majority of course directors cited both humor and detachment/depersonalization. Several course directors indicated that students have access to faculty in humanities, ethics, and psychology throughout the process if they are having difficulty coping with dissection.

Finally, medical schools varied in the amount of predissection discussion students have about the process of dissection. The majority of schools encourage students to humanize their cadavers and offer emotional support to students by incorporating a discussion of the body donation program and at least some mention of death and dying from both the medical and humanities perspectives. The students at three schools are invited to attend optional peer group sessions in which a facilitator leads discussion around the emotional impact of dissection and its relation to the medical humanities. The only medical school at which there are no orientation sessions before or during the dissection process addressing the topics listed above is the same school at which the majority of students did not name the cadaver. The course director at this institution does not specifically address or prohibit the naming of cadavers.

DISCUSSION

Naming Is Prevalent

This study confirms the prevalence of the practice of medical students naming their cadavers during gross anatomy laboratory. Primary sources, both historic and modern, indicate that students and course directors view the naming of cadavers as a customary element of the rite of passage of dissection. Some medical students cited this tradition as the only reason they named their cadaver. This tradition may have basis in our societal norms, which compel us to ask and remember the names of those whom we meet. Thus, students want a name for their cadaver because a very intimate relationship develops throughout the course of the dissection, and feel an increasing need or desire to refer to the cadaver as something other than a pronoun. This idea is further supported by students who reported a longer dissection time being significantly more likely to name the cadaver than those who completed the dissection in fewer weeks. Because medical students are often told to think of the cadaver as their first patient or as a great teacher, the respect fundamental to this relationship underscores societal norms, provoking the discussion of naming.

Peer pressure may also fortify the tradition of naming. Students who participated in larger dissection groups named significantly more often than those in smaller ones. Furthermore, several students indicated that although they initially

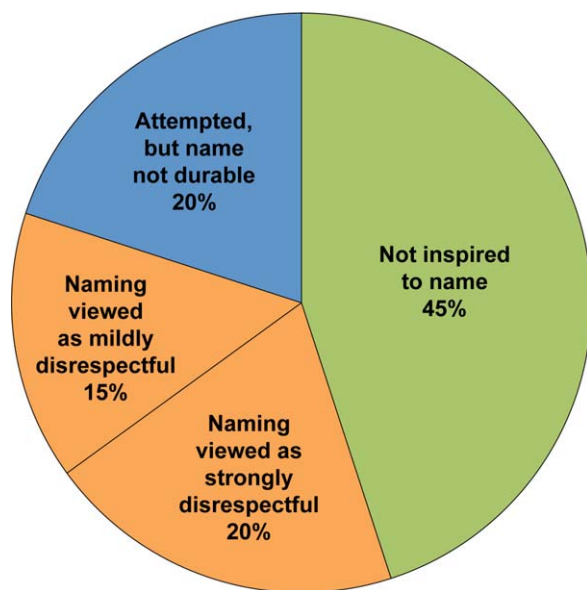


Figure 1.

Reasons for not naming the cadaver. Data from 12 United States medical schools between November 2011 and March 2012. Students who had completed the gross anatomy laboratory course ($n = 273$) wrote free responses describing their reasons for not naming their cadavers, which are grouped into the thematic categories.

objected to the practice of naming, they eventually joined the group in using the name assigned to the cadaver, again demonstrating possible peer influence. Rare incidents of discord within dissection groups occur; one group reported naming their cadaver after the student in the group who expressed a desire to not name it. Nevertheless, none of the respondents suggested that group members negatively pressured them to use the assigned name; although a form of peer pressure, the group dynamics related to naming do not seem to cause adverse effects for students.

The only previous analysis in the literature related to cadaver naming attempted to identify differences between students who named and those who did not. After observation of dissection at a single medical school, Hafferty (1991) reported that students could be split into two groups based on their reactions to dissection. Students in the first group were more likely to name their cadaver, more likely to be male, and less likely to consider donating their own body for dissection. Students in the second group were less likely to name their cadaver, more likely to be female, and more likely to consider donating their own body (Hafferty, 1991). This study does not replicate these findings; no relationship was identified between naming behavior, sex, race (both as an independent variable and when comparing student and cadaver race), and attitudes toward body donation. Of note, more medical students would support a family member in body donation than would consider donating their own body. Three possibilities explain this difference. First, Hafferty's findings represent the culture at one medical school at which he collected data, whereas the survey data comprise the viewpoints of students from 12 different schools. Second, medical students' viewpoints may be shifting as course directors continue to emphasize the humanistic qualities of the cadaver.

Third, the practice of naming is not completely individual, and differences in attitudes and behaviors of single students may be obscured by group dynamics, especially when making comparisons such as the naming behavior of students assigned to cadavers of the same or different race as themselves.

Course directors who discourage the naming of cadavers often cite trying to avoid potential acts of disrespect through naming. The majority of names given to cadavers within the current sample, however, allude to the cadaver's age and lack of disrespect. Furthermore, there is no indication of a perceived disrespect in naming when considering the congruity of students who named their cadaver and attitudes toward dissection and self or family body donation.

Finally, integrating dissection into the context of the medical humanities through sessions with students before and/or during the gross anatomy course has an impact on students' coping with dissection (Coulehan et al., 1995) and on the rates of cadaver naming. Kotzé and Mole (2013) demonstrated the usage of both informal and organized peer discussion during the dissection to cope with the process and recommended establishing a structured forum. When studying students' reaction to dissection, Lella and Pawluch (1988) observed that students who were not given emotional support were more likely to cope by objectifying the cadaver. In the current sample of students, those who did not have any orientation to dissection were more likely to not name the cadaver, and thus cope by focusing solely on the dissection. Conversely, students who are given support and are asked to humanize the cadaver are more likely to name. This correlation illustrates a shift from students relying largely on task-focused coping mechanisms to students incorporating emotion-focused coping mechanisms (Fleischmann, 2002) as well.

The Practice of Naming Offers Benefits to Medical Students

In addition to the positive correlates already presented, naming as a beneficial, emotion-focused coping mechanism is revealed in the themes that emerged between naming and a deeper connection with the cadaver and acknowledgement of the body donor's humanity.

Most students report naming the cadaver early in the process of dissection, indicating that naming may be a coping mechanism used in the early, awkward, and often uncomfortable moments as the students first interact with their cadaver. Likewise, 85% (488) of students who named would choose to name a subsequent cadaver, indicating that attitudes remained permanent even after students became more comfortable with dissection.

Many of the students selected names for their cadavers that represent the well-documented coping mechanism of gallows humor. As students face the stress of human dissection, the humor they offer in defense is a name for the cadaver: an amusing name relating to a physical characteristic of the cadaver, a witty pop culture reference relating to the process of dissection, and, exceedingly rarely, a name that evokes disrespect.

Although it may follow that attempts to dehumanize a cadaver might offer the most emotional protection to the student, the survey data indicate that the naming of cadavers counterintuitively supports efforts to maintain respect for the donor's humanity. Those who named the cadaver were

Table 3.

Factors Affecting Dissection Experience

	Overall, <i>N</i> (%)	Named, <i>N</i> (%)	Did not name, <i>N</i> (%)	χ^2	<i>P</i> -value
Total	847 (100.0)	574 (67.8)	273 (23.6)		
Medical student sex				0.51	0.475
Male	361 (42.7)	240 (66.5)	121 (33.5)		
Female	484 (57.3)	333 (68.7)	151 (31.1)		
Type of medical student				0.009	0.925
Traditional	567 (67.2)	383 (67.5)	184 (32.5)		
Nontraditional	277 (32.8)	188 (67.9)	89 (32.1)		
Remembered cadaver's eye color				7.59	0.006
Remembered	291 (34.5)	215 (73.9)	76 (26.1)		
Did not remember	553 (65.5)	357 (62.4)	196 (35.4)		
Thought about cadaver's life				11.15	0.001
Often	284 (33.6)	214 (75.4)	70 (24.6)		
Seldom or never	561 (66.4)	359 (64.0)	202 (36.0)		
Support for family member donating body				1.88	0.391
Yes	389 (45.9)	266 (68.4)	123 (31.6)		
Unsure	304 (35.9)	198 (65.1)	106 (34.9)		
No	153 (18.1)	109 (71.2)	44 (28.8)		
Donate one's own body				2.35	0.309
Yes	234 (27.6)	156 (66.7)	78 (33.3)		
Unsure	303 (35.8)	215 (71.0)	88 (29.0)		
No	309 (36.5)	202 (65.4)	107 (34.6)		
Age at dissection (years mean \pm SD)	24.1 (2.8)	24.0 (2.9)	24.3 (2.7)	1.128 ^a	0.260
Dissection group size (mean \pm SD)	5.6 (1.5)	5.8 (1.4)	5.2 (1.8)	-4.937 ^a	< 0.001
Weeks spent on dissection (mean \pm SD)	17.8 (9.8)	18.9 (10.0)	15.5 (9.2)	-4.758 ^a	< 0.001
Dissection personally completed (mean % \pm SD)	27.9 (17.3)	27.3 (17.2)	29.2 (17.2)	1.512 ^a	0.131

^a*t* value; Data from 847 medical students at 12 U.S. medical schools (November 2011–March 2012) who had completed gross anatomy course in which they were assigned one cadaver and did not know the cadaver's birth name. Comparisons are made between those who named and those who did not name their cadaver using chi-square analyses or *t*-tests.

significantly more likely to report spending more time thinking about the donor's life. For example, many students reported remembering details about their cadaver such as the presence of body modifications (e.g., tattoos and piercings) and signs of life events (e.g., scars), but in the absence of data about the actual incidence of these cadaveric markings, it was impossible to determine if those who named the cadaver had better recall or not. On the other hand, students who named their cadaver were significantly more likely to report remembering their cadaver's eye color. Although course directors report that the eye color of cadavers can be difficult to discern after the preservation process, the student's memory of the eye color either represents an attention to the details of the cadaver or is evidence of the student's development of a predeath "persona" for their cadaver. Both of these explanations imply that he or she developed a more intimate relationship with the cadaver and the process of

naming, therefore, seems to aid in increasing students' attention to the humanistic qualities of their cadavers.

There seem to be limits to the development of this predeath persona reflected in the fact that more students named their cadaver than indicated that they would want to know the donor's birth name. Similarly, when students who did not know the birth name were asked how much they would use the birth name if they learned it, their answers far exceeded the actual birth name usage by the small group of students to whom this information was provided. These findings indicate that while students are comfortable recognizing the humanity of their cadaver, they still need to distance themselves from the reality of the donor's life. Inventive naming allows students to acknowledge the cadaver's personhood, while psychologically shielding themselves enough to be comfortable with the dissection.

Assigning a name to the cadaver may also be a way of paying tribute to the body donor. Many students cite physical

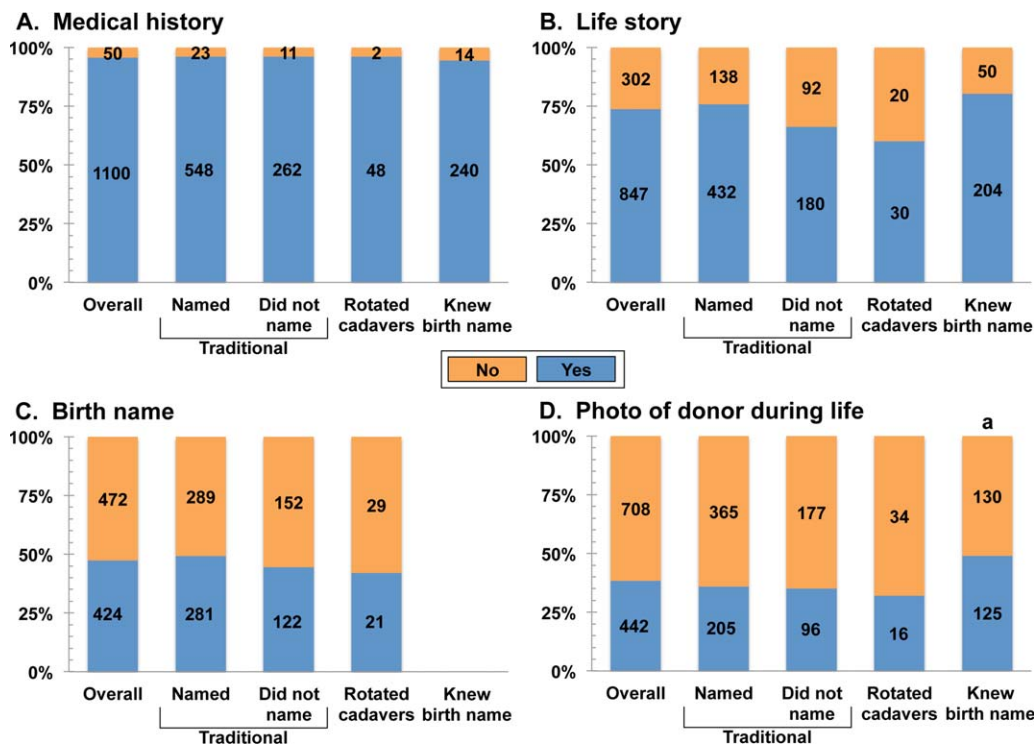


Figure 2.

Attitudes toward cadaver information. Data from 12 U.S. medical schools between November 2011 and March 2012. Medical students who had completed the gross anatomy laboratory course were asked whether they would want to know/see: (A) the medical history of their cadaver; (B) the life story of their cadaver; (C) their cadaver's birth name; and (D) a photo of the body donor during life. Results are reported for the collective group (all respondents) and based on students' dissection experience: those who completed the dissection in a traditional anatomy laboratory with one cadaver and did not know the donor's birth name; those who were assigned to several cadavers and did not know the birth name; and those who were assigned to one cadaver but were told the birth name. The traditional group is further segmented into students who named and students who did not name their cadavers. χ^2 analyses were performed on data for each question; ^a $P < 0.001$.

characteristics or tattoos as the inspiration for the name they gave to the cadaver. In this way, they recognize clues of the donor's life and personality without actually meeting him or her. This name has the potential to be a more authentic description of the individual than a name assigned at birth and can be thought of as a eulogy in its own right.

Finally, one in 10 respondents reported finding the practice of naming disrespectful. Thus, the practice of naming is not a coping mechanism used by all students; some have the opposite reaction and distance themselves from the cadaver. Several students explicitly indicated that not naming the cadaver allowed them to remain sufficiently detached from the cadaver as a person. These students likely used denial of the cadaver's personhood as a coping mechanism to successfully complete the dissection. Forcing these students into a more in-depth recognition of the humanistic qualities of the cadaver would likely increase the psychological stress they experience during dissection.

Students Want More Information About Their Cadavers

Students want more information about their cadavers than the customary age, occupation, and cause of death. A strong, inverse trend in the responses to these questions was identified: as the intimacy of the information increases,

fewer students indicate that they would want that information. Certainly future physicians are interested in the medical history of the cadaver (more than 90% of students indicated that they would want this information), which could be of use in explaining anomalies and pathologies that students encounter during the dissection. The majority of students said they would like to know the life story of the donor, and this curiosity correlates to the fact that most students indicated that they had thought about the cadaver's life during the course of the dissection. Fewer than half of the students, however, would want to know the birth name of the donor (as discussed above) or see a photo of the donor during life. Interestingly, students in the smaller subgroup of students who were told their cadaver's birth name were more likely to say they would want to see a photo of the body donor during life, yet they were less likely to actually use the birth name, when compared with the predicted use by students without the birth name. Again, these findings demonstrate that while students are interested in recognizing the cadaver's humanity, a line separates this curiosity from "too much information."

Future Work

Several areas for further research have emerged based on the survey results. First, the study's major weakness is selection

bias. Individual student and course director participation was voluntary, which possibly introduces selection bias in both the medical schools and individual medical students who chose to participate. Choice to participate could be affected by attitudes or strength of attitudes on the topic. When compared with the Association of American Medical Colleges' database of medical student demographics, survey respondents differed in sex (a higher percentage of female respondents) and racial composition (AAMC, 2011). A more complete study in which the respondents more closely represent medical students on the whole is necessary. A higher response rate would help rule out selection bias due to attitudes. Recall bias could be minimized by surveying only first-year students immediately after they complete the dissection.

Second, a significant difference in the rates of naming when considering respondents' religious beliefs was identified. More questions about students' beliefs are needed (e.g., thoughts about the afterlife, connection between physical body and spirit) to elucidate the impact of students' religious affiliations on their views of the cadaver. Likewise, a follow-up survey to both students and faculty who find the practice of cadaver naming disrespectful would aid in determining what exactly about the naming process is bothersome.

There were many differences between the small group of 250 students who were told the birth name of their cadaver and the respondents overall. Expanding the former group by surveying students from all medical schools where students are provided with this information would elucidate whether this practice is beneficial.

Finally, the most complete way to further analyze students' reactions to dissection as a function of familiarity with the cadaver would be a randomized controlled study in which students received varying amounts of information about their cadaver. Subjective and objective data relating to the students' predissection views, dissection experience, and subsequent attitudes about dissection could reveal positive and negative impacts, both emotionally and academically, of confronting the personhood of the cadaver during dissection.

CONCLUSIONS

Cadaver naming during the gross anatomy dissection is both prevalent and useful for medical students. There is little evidence that the practice involves outright disrespect for the cadaver, so anatomy course directors should not forbid students from naming their cadaver. One way to avoid potential disrespect would be to provide students with more information—or the option to learn more information—about the body donor. Providing just the first name of the donor might allow for enough anonymity to protect the family, but still allow the student to relate to the cadaver in a meaningful way without the need for inventive naming. Regardless, the current humanities focus in medical education when applied to cadaver dissection has clear utility in supporting medical students during this stressful induction into medicine.

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APPENDIX: STUDENT SURVEY

An online, progressive logic questionnaire was distributed to medical students via an e-mailed link. Each major heading represents a separate electronic page of the survey and the students to whom each page was presented is given in parentheses. Students gave free response answers to questions for which there are no multiple choice answers provided.

i. Gross Anatomy Laboratory (*all students*)

- How long did it take you to complete the dissection in Gross Anatomy (in weeks)?
- How many students, including yourself, were in your dissection group?
- To your best estimate, what percentage of the dissection did you personally complete?
- Did your group have one cadaver or rotate through several cadavers?
 - One cadaver
 - We rotated through several cadavers

ii. Your Cadaver (*students who were assigned to only one cadaver*)

- What was the sex of your cadaver?
 - Male
 - Female
- What was your cadaver's age at death, in years?
- What was your cadaver's cause of death?
- What was your cadaver's occupation?
- To your best approximation, to which race do you think your cadaver belongs?
 - Asian
 - Black/African descent
 - East Indian
 - Latino/Hispanic
 - Middle Eastern
 - Native American
 - Pacific Islander
 - White/Caucasian
 - I prefer not to answer
 - Other:
- What color were your cadaver's eyes?
 - Blue
 - Black
 - Hazel
 - Green

- Brown
 - I do not know
- Did your cadaver have any evidence of body modification (e.g. tattoos or piercings)?
 - Did your cadaver have any physical clues of life events (e.g. surgical scars, congenital abnormalities)?
 - Were you provided with your cadaver's birth name?
 - Yes
 - No
- ### iii. Your Cadaver (*students who dissected one cadaver, and knew the cadaver's birth name*)
- Did you or group members refer to the cadaver using the birth name?
 - Yes
 - No
 - How often when referring to your cadaver (verbally or mentally) did you use the birth name?
 - Never
 - Rarely
 - A lot
 - Always
- ### iv. Your Dissection Experience (*students who dissected one cadaver, and did not know the cadaver's birth name*)
- Did your cadaver have a name that you or group members called it?
 - Yes
 - No
 - How did you feel about naming your cadaver?
 - I INITIATED the naming.
 - I did NOT object, but I did not initiate the naming.
 - I did NOT object, but my group did not name.
 - I OBJECTED and told the group, but eventually participated in the naming.
 - I OBJECTED and did not use the name assigned to the cadaver.
 - I OBJECTED and this influenced the group to not name the cadaver.
 - Other:
- ### v. Questions for those who DID name their cadaver (*students who dissected one cadaver, did not know the cadaver's birth name, and named the cadaver*)
- What did you name/call your cadaver?
 - What is the reason this name was chosen?
 - Who initially suggested your cadaver's name?
 - I did
 - Another member of the group
 - We settled on one after several were mentioned
 - When during the Gross Anatomy course did you name your cadaver?
 - Toward the beginning
 - Toward the mid-point
 - Toward the end
 - How often when referring to your cadaver (verbally or mentally) did you use the selected name?
 - Never
 - Rarely
 - A lot
 - Always
 - If you had the opportunity to dissect another cadaver, how likely is it that you would give that cadaver a name?
 - More likely
 - Just as likely
 - Less likely

- vi. **Questions for those who DID NOT name their cadaver** (*students who dissected one cadaver, did not know the cadaver's birth name, and did not name the cadaver*)
1. What was the main reason you did not name your cadaver?
 - a. Someone in my group strongly objected
 - b. I felt it would be disrespectful
 - c. It allowed me to remain detached during dissection
 - d. It never came up
 - e. I worried others would disapprove
 - f. Other:
 2. If you had the opportunity to dissect another cadaver, how likely is it that you would give that cadaver a name?
 - a. More likely
 - b. Just as likely
 - c. Less likely
- vii. **Feelings About Dissection** (*students who did not know the cadaver's birth name*)
1. Would you have liked to know your cadaver's birth name?
 - a. Yes
 - b. No
 2. If you knew your cadaver's birth name, would you have referred to your cadaver as such?
 - a. Yes
 - b. No
- viii. **Feelings About Dissection** (*all students*)
1. Would you have liked to know your cadaver's life story?
 - a. Yes
 - b. No
 2. How much time did you spend thinking about your cadaver's life?
 - a. Not at all
 - b. Once or twice
 - c. Often
 - d. So much that it got in the way of my ability to dissect
 3. Would you have liked to know your cadaver's medical history?
 - a. Yes
 - b. No
 4. Would you want to see a live picture of your cadaver?
 - a. Yes
 - b. No
5. Would you support a family member donating their body for dissection in a medical school anatomy laboratory?
 - a. Yes
 - b. No
 - c. Unsure
6. Would YOU donate your body for dissection in a medical school anatomy laboratory?
 - a. Yes
 - b. No
 - c. Unsure
- ix. **Demographic Information** (*all students*)
1. What is your sex?
 - a. Male
 - b. Female
 2. What is your age, in years?
 3. Which of the following best describes your race?
 - a. Asian
 - b. Black/African descent
 - c. East Indian
 - d. Latino/Hispanic
 - e. Middle Eastern
 - f. Native American
 - g. Pacific Islander
 - h. White/Caucasian
 - i. I prefer not to answer
 - j. Other:
 4. Which of the following best describes your religious beliefs?
 - a. Agnostic
 - b. Atheist
 - c. Buddhist/Taoist
 - d. Christian—Catholic
 - e. Christian—LDS
 - f. Christian—Other
 - g. Christian—Protestant
 - h. Hindu
 - i. Jewish
 - j. Muslim/Islam
 - k. Spiritual, but not religious
 - l. I prefer not to answer
 - m. Other:
 5. What medical school do you attend?
 6. What year will you graduate from medical school?