

What Training Is Needed in the Fourth Year of Medical School? Views of Residency Program Directors

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Abstract

Purpose

To identify common struggles of interns, determine residency program directors' (PDs') views of the competencies to be gained in the fourth year of medical school, and apply this information to formulate goals of curricular reform and student advising.

Method

In 2007, semistructured interviews were conducted with 30 PDs in the 10 most common specialty choices of students at the University of California, San Francisco, School of Medicine to assess the PDs' priorities for knowledge, skills, and attitudes to be acquired in the fourth year. Interviews were coded to identify major themes.

Results

Common struggles of interns were lack of self-reflection and improvement, poor organizational skills, underdeveloped professionalism, and lack of medical knowledge. The Accreditation Council for Graduate Medical Education competencies of patient care, practice-based learning and improvement, interpersonal and communication skills, and professionalism were deemed fundamental to fourth-year students' development. Rotations recommended across specialties were a subinternship in a student's future field and in internal medicine (IM), rotations in an IM subspecialty, critical care, and emergency and ambulatory medicine. PDs encouraged minimizing additional time

spent in the student's future field. Suggested coursework included an intensively coached transitional subinternship and courses to improve students' medical knowledge.

Conclusions

PDs deemed the fourth year to have a critical role in the curriculum. There was consensus about expected fourth-year competencies and the common clinical experiences that best prepare students for residency training. These findings support using the fourth year to transition students to graduate medical training and highlight areas for curricular innovation.

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While many medical schools have redesigned the first two years of their curricula in the past decade,^{1–3} and some have implemented pilot programs for the third year,^{4,5} they have seldom investigated possible reforms in their fourth-year curricula and even less often undertaken actual reform.⁵ In the 1950s, most medical schools altered their curricula by focusing the third year on inpatient clinical experiences and moving outpatient rotations to the fourth year. From the 1960s to the 1970s, most schools further changed the fourth year by making it largely an elective inpatient experience.⁴ Few reforms occurred between 1980 and 2000, with the exception of reductions in elective time due to increased clinical coursework requirements.⁵ Currently, at most schools the fourth-year curriculum consists

primarily of student-chosen electives aimed to facilitate students' career decisions and broaden their clinical exposure through multiple subinternships or subspecialty electives. Students also attempt to enhance acceptance into competitive residency programs by completing rotations at specific institutions where the students would like to match (termed *away rotations* or the *preresidency syndrome*).^{6,7}

Specific recommendations for fourth-year clinical rotations do exist for students applying in family medicine, obstetrics–gynecology, and surgery.^{8–11} However, three out of four of these recommendations were made prior to 1995 and, thus, before the last wave of curricular reform of the first three years of medical school.

By interviewing residency program directors (PDs) in 10 different specialties, we aimed to determine the knowledge, skills, and attitudes that PDs value most in their incoming interns across specialties. Specifically, we undertook to answer these questions: What are the common

struggles that PDs identify in interns in their programs? Are there clinical competencies that the fourth year should provide to students that they do not gain in the third year? How can the fourth year be modified to better prepare students for internship?

Method

Sample and design. In January 2007, we contacted 42 PDs from 43 U.S. residency programs. We chose the programs by selecting those specialties and residency programs most commonly matched into by medical students from the University of California, San Francisco, School of Medicine (UCSF) from 2001 to 2006. We were interested in PDs' views in refining our fourth year at UCSF; our goal was to better prepare graduates to perform as high-functioning interns in their programs. Thus, we concentrated on programs where a significant number of our graduates train: the five most frequently selected programs in the six most popular specialties and the three most frequently selected programs in the next four most popular specialties,

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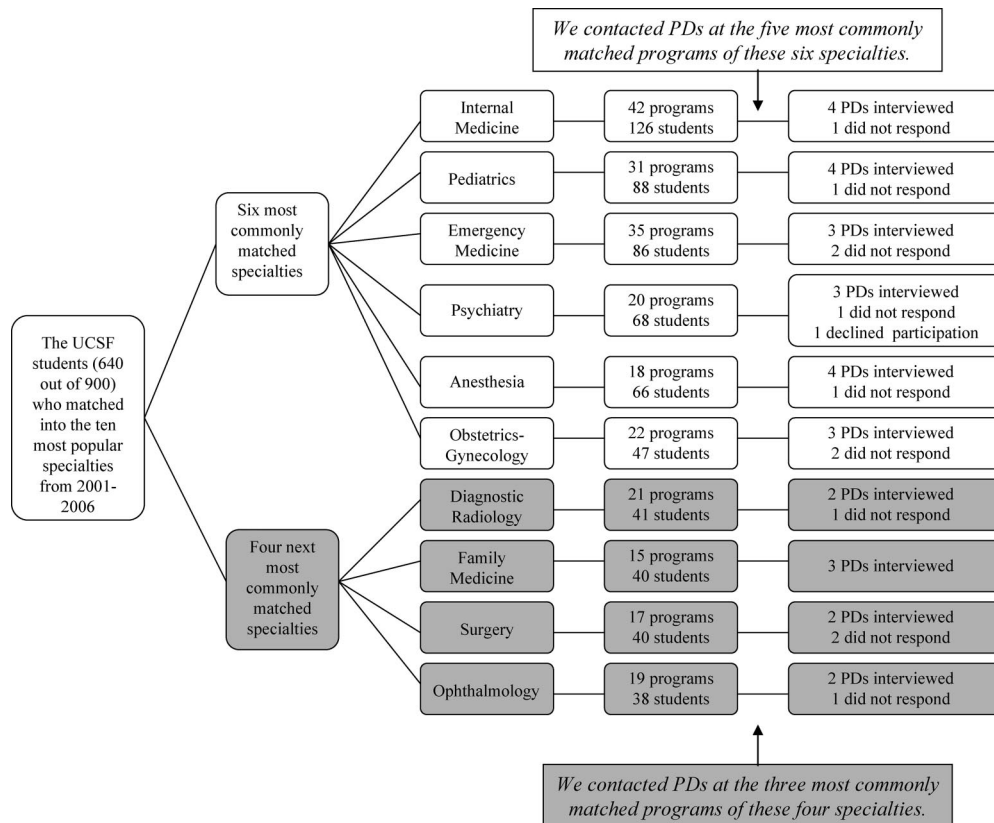


Figure 1 Methods used by the authors of this report to identify which U.S. residency program directors (PDs) to interview in 2007. From the top six most commonly matched specialties from graduates of the University of California, San Francisco, School of Medicine, they contacted five residency PDs; from the next four most commonly matched specialties, they contacted three residency PDs. (Note: Two of the three surgery PDs did not respond to attempts to be interviewed. Consequently, one PD was interviewed at the home institution of one of the authors).

totaling 10 different specialties (see Figure 1). Selected PDs received up to four e-mail invitations to participate. One PD declined the invitation, and 13 never responded to our request. Because we were able to interview only two surgery PDs from our list of potential PDs, we interviewed the surgery PD from one of our home institutions. We interviewed 30 (70%) of the 43 invited PDs. The UCSF institutional review board approved the study.

Instruments. Prior to the interview, each PD completed a demographic survey. One of us (P.J.L.) conducted semistructured telephone interviews of all PDs, lasting 20 to 45 minutes after obtaining verbal consent at the start of each telephone interview. Five of us (P.J.L., E.A., H.L., M.C., G.M.H.) developed the interview questions (see List 1).

Procedures. The interviewer asked for details and specific examples when necessary. PDs focused on competencies when answering the third question about differences between third-year and fourth-year students. Thus, after 16

interviews, we added a new question to the interview, directly asking PDs to identify competencies they expect students to gain in the fourth year of medical school that they may not gain during the third year. We audiorecorded the interviews and took handwritten notes.

Analysis. Three of us (P.J.L., A.T., G.M.H.) independently read three transcripts to generate codes. We coded in an ongoing manner, combining and reconciling codes as they were generated for 17 interviews. Two of the three investigators then coded the remaining 13 interviews, discussing discrepancies to reach a consensus. Only themes mentioned by at least seven participants (25%) are included here. Because of the nature of our sampling, in which the highest number of PDs interviewed from any given specialty was four, 25% of our sample captured the views of at least seven participants representing at least two different disciplines—ensuring that the themes mentioned were not discipline-specific.¹²

Results

The 30 participating PDs represented 21 institutions and five of the nine U.S. geographic regions as defined by the American Medical Association (New England, Mid Atlantic, West North Central, Mountain, Pacific).¹³ Twenty-one (73%) residency programs were university based, seven (23%) were community based only, and two (7%) were community based with university affiliation. Eight (26%), 11 (37%), and 11 (37%) PDs interviewed were assistant professors, associate professors, and full professors, respectively. Of those interviewed, five (17%) were associate PDs.

Common struggles of interns

We asked about interns’ struggles to identify problems that could be predicted and addressed in the fourth year of medical school. Common difficulties reported were lack of self-reflection and improvement, poor organizational skills, underdeveloped professionalism, and weak medical knowledge; most struggles overlapped with the Accreditation

List 1

Questions Used in the Authors' Interviews of 30 U.S. Residency Program Directors, 2007

1. Name rotations you think all students going into your specialty should take in their fourth year. How do you feel about audition/away rotations?
2. How much time should a student spend in his/her chosen specialty versus in other fields?
3. We want to assess the level of responsibility that a fourth-year student should have in order to be adequately prepared for internship. What are the differences you would like to see between a third-year student and a fourth-year student?
4. What additional competencies do you expect a student to gain in the fourth year of medical school that he/she did not get in the third year?*
5. Think of the last five interns that really struggled. Were there any themes?
6. Invent for me two to three fourth-year medical school rotations that would strengthen a student's arrival for your internship. This can also be for a student who has already matched.

*The first 16 program directors who were interviewed focused on competencies when answering the third question. So, from the 17th interview onward, the authors added this question (#4).

Council for Graduate Medical Education (ACGME) competencies (see Table 1).

Twelve (40%) PDs commented on the practice-based learning and improvement competency with respect to self-reflection and improvement, including an inability to acknowledge one's own weaknesses, receive feedback, and reflect on one's practice. As one PD commented,

The struggle was around not being able to incorporate feedback. . . . You can teach someone who has deficiencies if they're willing to sit down with you and examine their deficiencies. Someone who is unable to admit they have deficiencies is such a strong barrier to overcome.

Ten (33%) PDs mentioned that poor organizational skills particularly hindered interns' success. This could be complicated by an inability to develop appropriate study skills to acquire knowledge while working intern hours and struggling to prioritize responsibilities.

We have been encountering more residents who have a difficult time multitasking . . . and working more efficiently. They are . . . very thorough but almost to the point of being paralyzed.

Some spend so much time perusing electronic medical records that they aren't able to get through their work.

Eight (27%) PDs discussed the medical knowledge competency, acknowledging a poor fund of knowledge as a common problem. Ten (33%) PDs additionally described difficulty with application of knowledge: applying knowledge to clinical practice, developing a differential diagnosis, or having adequate clinical judgment. One PD attributed this difficulty to the fact that medical schools do not allow students enough autonomy:

You must ultimately have responsibility in a system that allows for appropriate supervision and support. A number of our residents won't feel comfortable making decisions. They turn to the attending and say, "Well, what should I do?" My response is, "What do you mean 'What should you do? Aren't you a doctor?'"

Nine (30%) respondents felt that lack of professionalism, including responsibility and reliability, were common problems faced by interns. This included failure to assume professional responsibility and ownership of patient care:

Residents are less professional than they were a decade ago: they don't dress as well, they don't comport themselves in the way they should, they are not as courteous, and there is selfish behavior. It [professionalism] is not just an idea; it is something that can be better developed in the fourth year.

Competencies

Above, we described common struggles of interns. In this section, however, we discuss competencies that PDs suggested fourth-year students should gain prior to residency training. We asked about competencies in general, but we chose to organize the data according to the ACGME competencies in order to align the findings with current residency requirements.^{14,15} PDs identified many of the ACGME competencies as important curricular goals of the fourth year of medical school (see Table 1). PDs cited the progressive development of the patient-care competency through advanced clinical reasoning, increased independence, and greater patient loads as a primary goal in the fourth year. Eighteen (60%) commented on specific aspects of advanced clinical reasoning, including applying one's fund of knowledge to patient care, completing a

complaint-focused history and physical exam, developing a reasonable differential diagnosis, and creating a management plan:

What I want for a fourth-year student is that they get themselves onto rotations where they learn how to make decisions, how to handle responsibility, and learn to how to be a doctor. I want to ask, "Student—doctor, what is your diagnosis, why do you think that is the diagnosis, what medical tests should be ordered and why?" . . . and for them to have answers to those things.

Sixteen (53%) PDs commented that fourth-year students should be at or near the same level of independence as interns, and eight (27%) specifically commented on the importance of managing a larger patient load:

In preparation [for internship, students should] have more autonomy and independence as a fourth year [student] . . . to be able to be more efficient, take less time to do clinical assessment, allowing them to see more patients in a timely manner when they are interns.

The next most commonly cited competency was practice-based learning and improvement. Ten (33%) PDs raised the issue of self-reflection and improvement. This encompassed students' awareness of their limits as well as the ability to elicit, accept, and incorporate feedback pertaining to their fund of knowledge, confidence levels, and interpersonal skills:

In the fourth year, it is very important to know what you know, when to ask for help, confidence of when to move ahead more autonomously in taking care of patients. It is more of a mindset than a difference in knowledge.

Providing students with a strong understanding of the use of evidence-based medicine (EBM) was important to nine (30%) PDs. One said that this is an "absolute essential skill nowadays." Another stated,

A fourth-year should gain . . . the ability to look into the literature deeply, or to delve into a question having to do with their patients and try to answer it using a high-quality source and then apply that to patient care . . . The fourth year offers an opportunity to do so because of increased ownership, autonomy, and independence.

Communication skills and professionalism competencies were also sometimes recommended as needing more attention in the fourth year. Eight (27%) PDs

Table 1

Comparison of the ACGME Core Competencies With 30 Program Directors' Views of Common Struggles of Interns and the Related Competencies Interns Should Gain in the Fourth Year of Medical School, 2007*

ACGME core competency	Common struggle of interns	Program directors reporting struggle: No. (%)	Competency interns should gain as fourth-year medical students	Program directors advocating the competency to be gained in the fourth year: No. (%)
Practice-based learning and improvement	<ul style="list-style-type: none"> Self-reflection and improvement 	12 (40)	<ul style="list-style-type: none"> Self-reflection and improvement Effective use of evidence-based medicine 	<ul style="list-style-type: none"> 10 (33) 9 (30)
Patient care	<ul style="list-style-type: none"> Organization Application of knowledge 	<ul style="list-style-type: none"> 10 (33) 10 (33) 	<ul style="list-style-type: none"> Advanced clinical reasoning Near intern-level independence Capacity to care for more patients 	<ul style="list-style-type: none"> 18 (60) 16 (53) 8 (27)
Professionalism	<ul style="list-style-type: none"> Responsibility and reliability 	9 (30)	<ul style="list-style-type: none"> Responsibility and reliability Ownership of patient care 	<ul style="list-style-type: none"> 8 (27) 8 (27)
Medical knowledge	<ul style="list-style-type: none"> Fund of knowledge 	8 (27)	NA	NA
Interpersonal and communication skills	NA	NA	<ul style="list-style-type: none"> Communication with patients 	8 (27)
Systems-based practices	NA	NA	NA	NA

*ACGME indicates Accreditation Council for Graduate Medical Education.

identified the need for advanced communication skills with patients. Another eight (27%) felt that responsibility, reliability and taking ownership of patient care are important competencies gained during the fourth year.

The good subinterns are able to take professional responsibility for a group of patients, and don't assume that anyone's going to pick up their slack.

Recommended rotations

Twenty-eight (93%) PDs highly recommended that students complete a subinternship in the field in which they are applying. Also, eight (50%) PDs from the cognitive specialties (internal medicine, pediatrics, psychiatry, family medicine, and radiology) and seven (50%) from the more procedural specialties (anesthesia, emergency medicine, obstetrics–gynecology, surgery, and ophthalmology) suggested completing an internal medicine subinternship. Thirteen (43%) recommended a critical care rotation (medical, surgical, cardiac, or neonatal intensive care). Fifteen (50%) PDs recommended taking at least one, if not more, internal medicine subspecialty rotations. Emergency medicine and ambulatory care electives were each

recommended by eight (27%) PDs (see Table 2).

When asked about away rotations (performed at outside institutions), 16 (53%) recommended them, mainly for the sole purpose of learning about a specific program in which a student is interested. An anesthesia PD said,

Be very clear that they are there to learn, not to impress . . . nothing is more impressive to me than somebody who is focused on taking care of their patients, learning, and doing the job.

Nine (30%) PDs recommended away rotations for an academically weak student, but 11 (37%) warned that students are examined closely during these rotations. Twenty-five (83%) PDs recommended that students minimize the number of fourth-year rotations they do in their intended specialty, keeping it to one to three rotations; rather, they should devote their time to learning information that either they will not be exposed to during residency or that will complement their residency training.

Rotations that ought to exist

Suggested rotations to strengthen students' skills for internship pointed to what two PDs described as an "intensively coached subinternship." In a four-week

rotation, students would work extensively with a senior resident or attending to enhance history-taking and physical exam techniques, and expand skills in the patient-care, practice-based learning and improvement, and systems-based practices competencies:

The subintern has a small number of patients to care for over the month and has all the time in the world to learn about them, their diseases, look up articles on them, and has a master teacher meet with them every day. . . . There is a mixture of ownership of patients and their care in a semi-independent fashion, but ample time to delve deeply into questions that were generated in the course of their care.

Courses pertaining to the medical knowledge competency to increase students' funds of knowledge were suggested by 10 (33%) PDs. One recommended a classroom-based course in which students focus on pathophysiology in a clinical context they gained during the third and fourth years.

Although they did not achieve a 25% endorsement rate, other recommendations were for coursework on professionalism, interpersonal and communication skills, and self-reflection. Training in the systems-based practice competency was recommended in the form of curriculum

Table 2

Rotations Recommended for the Fourth Year of Medical School as Identified During Interviews With 30 U.S. Residency Program Directors in 10 Specialties, 2007

Rotations recommended for the fourth year of medical school	No. (%) program directors making recommendation
Subinternship in field in which student is applying	28 (93)
Internal medicine subinternship	19 (63)
Internal medicine subspecialty	15 (50)
Critical care	13 (43)
Ambulatory care	8 (27)
Emergency medicine	8 (27)

on medicolegal issues, medical economics, and scholarship.

Discussion

During the third year, students focus on and often struggle with how to function in the health care setting, expand their knowledge of systems-based practices, apply their fund of knowledge to patient care, and determine their future fields.¹⁶ It is the final year of medical school that affords students time (1) to ready themselves for intern-level responsibilities, (2) to continue to broaden and deepen their understanding of health care, (3) to finalize their career choices, and (4) to apply to residency programs.

In Langdale et al's¹⁷ study, at least 70% of PDs across specialties agreed on 13 skills necessary for the beginning of the internship. These can be categorized in Pangaro's¹⁸ Reporter, Interpreter, Manager, Educator framework, developed to explain transitions in learners as they progress through medical training. From Langdale et al's study, creating a database of information and developing a relevant problem list are Reporter- and Interpreter-level skills included in the ACGME's patient-care and medical knowledge competencies. These should be acquired during the third year of medical school. The fourth year, on the other hand, should advance students to the Manager level. Examples from Langdale's study include learning to communicate clinical information effectively and recognizing personal limitations. This progression of skills is consistent with suggestions from PDs we interviewed.

PDs noted that interns often struggle with the practice-based learning and

improvement, professionalism, and medical knowledge competencies. This implies that either we as medical educators are not providing adequate authentic workplace roles for fourth-year students, or that we are, but the assessment tools we currently use do not accurately reflect performance. A number of PDs emphasized that standards for the fourth year may not be sufficiently rigorous and that students must not only be able to understand the medical issues but be able to apply them effectively to clinical and diagnostic reasoning.

This finding underscores the importance of distinguishing workplace learning from school. As opposed to a "school" way of learning, workplace learning occurs when new knowledge is integrated with everyday activities, under the guidance of a coach, and supported by formal didactics.¹⁹ From this perspective, the fourth year should provide students experience with advanced clinical skills and more demanding clinical situations while maintaining attention to self-reflection.²⁰ The intensively coached transitional subinternship could effectively transition students between the third and fourth years, while the traditional subinternship could advance them to a role equivalent to that of an intern.

We found consensus across specialties that fourth-year students should pursue subinternships in their future fields, in internal medicine, and in an internal medicine subspecialty. The internal medicine subinternship allows for the reinforcement of knowledge, skills, and attitudes necessary for residency.^{21,22} Critical care and emergency medicine rotations were encouraged because they provide students with cognitive, procedural,

and communication skills training for a variety of clinical presentations.^{23–26} A rotation in ambulatory medicine was also recommended and was found to increase performance on a clinical skills assessment in the fourth year.²⁷

Fourth-year students need to expand their knowledge in both clinical and nonclinical domains. Professionalism, interpersonal and communication skills, and self-reflection were raised as competencies to be developed in the fourth year, but they did not achieve a 25% endorsement rate for a specific focus of curricular development. Perhaps these domains simply need to be more effectively incorporated into existing coursework throughout medical school. Students' professionalism has a predictive and lasting impact on their careers as physicians: those unable to self-reflect and subsequently improve will encounter pervasive and long-lasting difficulties that will affect both those who work with and those who receive care from them.^{28,29}

PDs wanted interns educated as well-rounded physicians. Our study, supplemented by others, suggests that students can best strengthen their residency applications with fourth-year rotations chosen for their educational value as opposed to doing numerous electives in a student's intended specialty.^{7,8,11,30} Moreover, away rotations were not recommended to enhance chances of matching at a specific program. We recognize these data are contrary to findings in existing literature, notably with respect to orthopedic surgery residency selection.^{31–33}

Limitations

We interviewed PDs from programs who match students from UCSF. However, PDs were asked to reflect on all residents/students with whom they have worked, thus representing a broad spectrum of geographic areas and program type (university, community). We reached saturation in our analysis and feel that our results are representative. Many of the first 16 PDs interviewed described competencies to be developed in the fourth year, but they were not explicitly asked about competencies. Thus, these data may underrepresent the importance of competencies to the PDs as a group.

In this study, we focused on the 10 most common specialties into which our

students match; thus, some specialties were not included. We also analyzed the data across specialties to provide general recommendations for the fourth year.

Organizing the curriculum with specialty-specific tracks could be explored by looking at specialty-specific data and expanding the interviews to include more PDs. In response to Langdale et al's study, we chose to assess PDs during the period when we were determining how to innovate in the fourth year at UCSF.¹⁷ Interesting perspectives could also be gained from residents, students, and medical school deans.

Conclusion

This study illustrates the need for fourth-year students to have more authentic roles in patient care. The fourth year should contribute to a logical progression of professional maturation that leads from the third year and prepares students for internship. It should, however, serve a greater function than simply one of preparation. It has the potential to support the transition from the student role to that of the physician and to set the groundwork for lifelong learning. The PDs we interviewed identified key competencies students should acquire during the fourth year that they may not have gained in the third year: the progressive advancement of patient-care skills, practice-based learning and improvement, and professionalism. This suggests that during the course of the fourth year, students should progressively move out of a "school" to a "workplace" way of thinking in which patients, not students, are the central consideration. They should have the ability and the habits of mind to access information relevant to patient care, to appraise it, and to apply it judiciously. They should routinely practice self-reflection and have high standards for their own performance. Helping our students attain these goals will not be easy, but it must be done.

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Teaching and Learning Moments

Artist's Statement: *My Cadaver*

As an aspiring medical student, I had anticipated gross anatomy as long as I could remember. I had been waiting for the course so long, in fact, that when I walked into the lab on the first day of class, it almost felt like déjà-vu. I distinctly remember surveying the room and comparing it to my dreams, making a point to remember exactly how those first moments were making me feel. The first thing I noticed was the exposed cadavers, and I felt shame for their nudity. The overwhelming sensations of attending my first day of gross anatomy and the sheer magnitude of having to cut into what was once a human being had finally become a reality, and it was making me dizzy. To prevent myself from blacking out, I focused my attention on my cadaver.

She didn't look like a real person when I saw her for the first time. Her face was permanently distorted and her skin stiff like rubber. But the more I looked at her, the more I realized she used to be a real living person. She was human: The crinkles around her eyes from smiling often, and

even remnants of her nail polish accentuated her existence as a person. Where she had been, whom she loved, and what her life aspirations were—I can only imagine. But the one thing of which I was cognizant and absolutely certain was that her life was meaningful. And, interestingly enough, even in her death she continues to



My Cadaver.

pass on meaning—a special gift—the gift of her body to science.

One would typically admit that it is comforting that cadavers don't look like real people. It makes the task of dissection slightly easier. But in my case, every time I visit and study the gift this lady has given me, I see a selfless woman who has somehow taught me more about how precious life is than studying from a textbook. In addition to teaching me about the amazing intricacies of how the body functions, I see a person who has taught me to respect life. And I see a person who is proud of how much I have gained through her gift, which is the reason that when I look at my cadaver I envision a unique individual smiling up at me.

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Editor's Note: This Teaching and Learning Moments essay was contributed as a companion to this month's AM Cover Art selection.