To Dissect or Not To Dissect?

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For most professional anatomists, there is no question of whether to dissect or not to dissect. After all, the very word "anatomy" means dissection (from the Greek anatomizein, meaning to cut apart). Through dissection, students have the opportunity to become personally acquainted with the human body, learning their way around by experience. Anatomy courses for medical students have the objective of imparting the anatomical knowledge and skills necessary for the practice of medicine. The importance of dissection to the teaching and learning of these skills is emphasized by the fact that 97% of medical schools require their students to participate in cadaver dissection.1

Although many anatomists consider dissection to be an essential component of anatomy courses, many department chairpersons and course directors are aware of mounting pressures to reduce or eliminate dissection. Some administrators perceive dissection as old-fashioned and outdated, especially when compared with state-of-the-art teaching tools such as virtual anatomy and computer-assisted learning programs. Additionally, the cost of maintaining cadavers and dissection facilities is considerable, and some view the new teaching technologies as a means of reducing the demands on shrinking financial resources. However, the shift to computer-based learning is also expensive, and it is unclear that significant money could in reality be saved by such curricular modifications.2

A second, although less direct, challenge to dissection has come from the Association of American Medical Colleges (AAMC).3-4 Their mandate to "change the way that medical students are trained" proposes to make students lifetime, self-directed, independent learners by teaching problem-solving and reasoning rather than "disembodied facts." To achieve this goal, they propose a greater emphasis on computer-assisted instruction and conversion to a problem-based curriculum that requires a radical change from a disciplinary to an interdisciplinary context. Regional dissection does not fit easily into a problem-based curriculum, and only a very few schools have adopted a purely problem-based approach. Although this resistance may reflect, in part, a reluctance to abandon dissection for a new approach, it is likely related to the fact that many medical schools lack the faculty and facilities to adopt this small-group approach to teaching the basic sciences. A third challenge to dissection is related to the faculty that teach gross anatomy courses. Gross anatomy teachers have a much greater teaching commitment time wise than their colleagues in other anatomy courses or other basic science courses. Much of this extra commitment results from the extra time spent teaching, especially if they want promotion and tenure. Nationwide, only funded gross anatomy faculty members are awarded tenure.1 Moreover, at many schools, gross anatomy faculty members are hired based on their funding status rather than their training and/or expertise in the dissecting laboratory. Faculty members who teach gross anatomy must have adequate training. Whereas most anatomists are not trained as physicians, it is obligatory that they additionally acquire some basic knowledge of the various clinical specialties and use this knowledge in their teaching.

It is imperative that anatomists be aware of the challenges to dissection so that they can be proactive in making a better case for continuing the unique educational value of the dissection experience. In reality, anatomists have been open and receptive to new ways of teaching gross anatomy, with many changes being made in recent years. The emphasis on facts has been supplanted by the practical application of anatomical knowledge to diagnosis and treatment (clinical anatomy). Anatomy courses have reduced the number of lectures (viewed as passive learning exercises) and readily adopted computer-assisted learning programs and some elements of problem-based learning, including clinical case studies and interactive small group sessions (viewed as active problem-solving exercises). In most anatomy courses, however, these new approaches supplement and complement, rather than replace, dissection. It is important to note that anatomy teachers believe that the dissecting laboratory experience offers the ultimate small-group, problem-solving, interactive learning experience.5

Anatomists must not only be prepared to recognize the threat to dissection and adjust to new challenges, but they must also make a case for the importance of retaining dissection as the best means of teaching and learning anatomy. What does dissection provide that cannot be obtained from electronic technology? What makes it worth the expense and effort?

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First and foremost, cadavers are real. The challenge for the student is to create in the mind's eye a three-dimensional picture of the patient's anatomy to call forth on demand. The best three-dimensional computer image is artificial and inherently inferior to the real thing, the cadaver. Dissection offers the look and feel of the real human body, including the relative strengths or fragility of the tissues and organs, and a superior appreciation of the body's three-dimensional construction.

Second, dissection offers an appreciation of human variability and the uniqueness of the individual pattern. Each cadaver is unique and presents important departures from the textbook description. Whereas many of these variations may be minor and inconsequential, as far as present knowledge goes, many variations are sufficiently significant to be of medical importance, anatomical interest, or both. The individual discovery and resulting appreciation of anatomical variation promotes logical and critical thinking, which serves the student well as he or she progresses in the clinical experience.

In addition, there are several lesser but certainly not insignificant benefits of the dissection experience. Dissection offers the student an opportunity to acquire manual dexterity and skill. Training in purposeful movement and hand-eye coordination is important to any area of medical practice. The small dissection groups (usually four to six students) promote teamwork, communication among partners, and self instruction, all important attributes for further medical training and the career ahead. Finally, the dissection experience is an opportunity for the student to confront the issues of death, dying, and bereavement early in medical training.

We are at a critical time in anatomical education, where the importance of dissection must be presented strongly and often to those who control medical school budgets and curricula. What is the proof that students of anatomy are best served by the dissection experience? The proof lies in the collective experience of the faculty members who teach gross anatomy, the students who benefit from the learning experience of the dissection laboratory, our colleagues in the clinical years who benefit from students who are well-prepared for study in their particular discipline, and most importantly the patients who benefit from well-trained physicians.

To dissect or not to dissect? The real question is whether we who believe in, and have benefited from, the privilege of human dissection will work actively to ensure that this opportunity is not lost to those who follow.

LITERATURE CITED
4 Association of American Medical Colleges (1992) "American Medical Education: Institutions, Programs, and Issues." Washington: AAMC.
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