

## Mini Review

# Mastering Cadaveric Dissection and Engaging Students: How to Become “An Amazing Asset” to Students in the Dissection Laboratory

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**Abstract**

As an anatomist, I am convinced that anatomy education is an essential component of the undergraduate medical curriculum. Regardless of how the curriculum changes, dissection-based experience remains the most effective way for students to learn anatomy. At Sidney Kimmel Medical College, we offer cadaveric dissection to both medical student class (about 270 students) and Physician Assistant (PA) class (about 150 students from both PA programs at Thomas Jefferson University and Arcadia University). Teaching gross anatomy in limited time to a large class can be challenging. Here, I would like to share my personal practice in the dissection laboratory as an anatomy educator with my fellow anatomists, to illustrate how we can more effectively guide students through their dissection experience. Hopefully, this article will initiate further discussion on this important topic.

## Your Confidence is Built on a Solid Foundation of Knowledge in Anatomy and Cadaveric Dissection

Comprehensive understanding of anatomical relationships and knowledge of important clinical applications provides a basis for confidence when instructors are in front of students. Knowledge will also make you a more effective and efficient dissector in the laboratory. To achieve this goal, we must be committed to life-long learning and self-improvement (never stop learning). To strengthen my knowledge and prepare for teaching, I find it helpful to consult multiple textbooks and atlases, seek advice from my friends and colleagues, and accumulate proofs of anatomic relationships from the human gifts during dissection.

## Bring a Positive Attitude to the Laboratory and Demonstrate Professionalism

Dissection can be a stressful experience for many students, particularly at the beginning of a course. Creating a cheerful and friendly atmosphere in the lab can help ease tension and make the dissection experience “FUN”. Every time I enter the lab, I quickly greet each and every group, give them brief instructions regarding the particular session, and tell them “we will have fun”. Faculty empathy towards students and respect for their needs as learners can also help our students feel more comfortable in the dissection lab. Teaching many dissection groups at the same time is also a stressful experience for faculty instructors. During dissection sessions, I constantly remind myself to be patient. When students ask me questions, I make sure that I listen carefully. Once I provide an answer, I always ask students whether their questions have been fully answered and their understanding has been made clear. Students are keenly sensitive to whether you are willing to help them by making yourself open and accessible. Here are some of the words that students have used to describe my efforts in the dissection room in the past several years:

Approachable, accessible, patient, willing to help, empathetic, influential, inspiring, energetic, professional, motivational, reliable, easy to talk to, brings a great attitude to lab; Effective, efficient, astoundingly good at dissection, an incredible asset to have in the dissection room, the epitome of efficiency

## Manage Time at Each Dissecting Table and Rotate Efficiently in the Laboratory so that all Tables Receive Adequate Help

Because of increasing class size, faculty instructors are often called upon to teach multiple groups at the same time. At Sidney Kimmel Medical College, each faculty member has responsibility for eight or nine dissecting tables. To ensure that all groups receive adequate help, instructors must be efficient and effective, so as to navigate quickly among the tables. During a typical 3-hour dissection session with nine dissecting groups, I usually make an effort to visit each table 2-3 times. This means that I spend 7-9 minutes on average each time that I stop at a dissecting table. At each table, I help students solve dissection problems, answer questions, and get the students moving in a new direction, before I switch to another table. Students certainly appreciate this planning and extra effort. Here are a few comments that I received from last year’s class reflecting this practice:

- She was able to rotate around the tables very efficiently, which enabled each group to not only finish early but also facilitated our understanding of the material.
- It felt like she was always available to us when she was in our room because she was so quick and helpful and easily accessible for questions.
- She has the best ability to navigate the dissecting room so that you see her multiple times and so that all lab groups are continuing to bode well in their dissection.
- She always spent a good amount of time at each table,

helping to clarify any unknown structures and making sure everyone understood what was going on in the dissection.

- She was able to move between tables quickly, and to balance her set rounds (to check-in on each table) with answering one-off questions as they arose.
- She makes an obvious effort to be attentive to all of the groups in a room to help when we are struggling.
- She made sure each table had a fair and adequate amount of time to discuss things with her. She rotated around the room at a solid pace.
- She always made sure to be available to whoever needed her in lab and worked quickly in getting to all the groups.

### Teach Students Dissecting Techniques to Facilitate Learning

During dissection, especially at the beginning of the course, instructors can demonstrate dissecting skills that will greatly benefit students during their subsequent dissections. Gaining technical skills in the lab makes the process of dissection more efficient and certainly facilitates students learning (see comments below).

- Not only could we trust her knowledge and depend on her to assist in difficult identifications and dissections, but she also taught us many important and helpful techniques that made us better dissectors and anatomy students in general.
- She was very helpful in our dissections not only helping advance our efforts but demonstrating how to properly dissect a body and preserve structures to the best of our abilities.
- She would make difficult cuts for us, but always made sure to teach us new techniques and tricks to finding the smaller structures.
- She is very helpful, and understands that most of us have very limited dissection skills at the beginning of the course, and gives the appropriate level of help to our group.
- She demonstrated amazing knowledge and skills/techniques as she dissected. It honestly was like art and watching her dissect was truly amazing.
- Her techniques in the dissecting room were ones we used for the entirety of our dissections and were invaluable.

### Avoid Dissecting for the Students – Help them get back on Track

Dissection is challenging and students may sometimes feel the need to rely on instructors for technical assistance. Students may want to sit back and watch as you dissect. I certainly offer my assistance to solve problems, but I try my best not to dissect for the students. For example, I may say to the group “dissection is so much fun that I sometimes forget to stop - oops”. Students’ comments demonstrate that they appreciate this particular approach.

- Whenever your group is stuck on a section of the dissection, Dr. Zhang will come over and quickly get the group back on track. She does this by orienting the student’s to what exactly we are looking at, what relationships we should be looking at, and then shows us how to quickly move forward with the dissection.

- She will help when you are stuck, but still make you find many structures for yourself.
- When providing help, she allowed us to come to the answers on our own without performing the dissections for us.
- I really like how Dr. Zhang is both incredibly helpful as well as hands-off enough for us to figure out our dissections by ourselves.
- I really like how she frequently checks up on our progress in the lab, but will not intervene unless we specifically ask for help.
- She was skillful at helping with dissections, but not taking over and doing them completely herself.
- She encouraged us to try things on our own before relying on the professors as a crutch. Continuing on with a dissection instead of asking for reassurance every step of the way was a great way to learn anatomy and to learn from our mistakes.

### Promote Active Learning through Active Interaction with Students

When students plead for help, instructors will sometimes relent and actually dissect. As I dissect, I have found it helpful to explain the approach that I am using and explain why I am dissecting in a certain way. Before I dissect, I demonstrate and review the key anatomical relationships with the students, help them to identify the landmark structures and the location of the target structures they could not find. As I begin to dissect, I explain to the students gathered at the table what I am doing and why I am doing it. I also point out why students could not find a particular structure, or explain to them why they came to a misidentification. I believe that this approach will inspire students to solve similar problems on their own in the future. In my opinion, this encounter becomes a very significant teaching moment. It provides an opportunity for faculty to answer questions, deliver knowledge, discuss clinical applications, and teach students to use a logical approach when solving problems. Equally important, is the opportunity to ask questions. Instead of answering a question, I frequently ask students a series of questions that eventually leads them to answer their original question (Socratic teaching). Students are proud of themselves when they arrive at the right answer through this approach. This is the moment when “active interaction” between students and faculty leads to “active learning”. Students take note of this approach to teaching and them like it:

- She offers great instruction and takes care to ensure that students see and understand particularly good specimens during each session. She also helps students to integrate lecture material in lab by offering brief explanations throughout the lab period.
- She would quickly tear through tissues while explaining what she was doing, why she was doing it, and how to relate it to the lectures.
- She clarifies confusing structures and relationships and answers questions directly and thoroughly.
- Her explanations were to the point and clear.
- She would solve our dissection problems within minutes while clearly explaining everything she was doing.
- She quickly assisted students to find what they were looking

for and accurately corrected any mis-identifications.

- She definitely made everything easier to understand.

### Constantly Quiz and Test Students' Knowledge during Dissection

During active interaction with students, I find it useful to constantly ask the students questions to test their knowledge. I quiz them on their basic understanding of anatomical relationships and the clinical significance of particular structures. Pathological findings and surgical procedures encountered during cadaver dissection also provide an excellent opportunity for teaching and learning. In addition, you can inspire students to identify anatomical variations and then discuss the clinical significance of these findings within their group. This approach to anatomy education is very effective in promoting interesting discussion among students and active learning (see comments below).

- She often quizzes us and tests our knowledge. This was very helpful in our learning process.
- She also quizzed us on important concepts.

- Her quizzing us on certain topics while she was at our table helped reinforce important concepts.

- She is good at teaching students in lab by asking questions at the appropriate level to foster learning.

All in all, deep affection for anatomy education provides the foundation for one to become an effective and influential anatomy instructor. I have the privilege to teach anatomical sciences in a medical school and I enjoy my job tremendously. I trust that my fellow anatomists feel the same, and I believe that everyone has their own tips regarding anatomy education. I anticipate that you will want to share your experiences, so that together we can grow stronger as educators and help make anatomy education more rewarding for us, and for our students.

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