



# Training Tomorrow's Physicians: Undergraduate Medical Education in Orthopaedic Surgery

Cara A. Cipriano, MD, MSc

It is a great honor to return to Penn more than fifteen years after I was introduced to the field of Orthopaedic Surgery here as a medical student. Since then, I've been fortunate to participate in medical education in various roles at different institutions. Based on these experiences, I have developed a vision of medical education in which teaching, mentorship, and inclusion are actively supported throughout our department. As the Director of Undergraduate Medical Education, and with the collaboration of our dedicated residents and faculty, I am working to achieve this by focusing on four goals:

**1. Provide all students with a fundamental understanding of musculoskeletal diagnosis and treatment.**

Musculoskeletal complaints are widespread and common, so all physicians should graduate with a basic understanding of conditions such as fractures, degenerative disease, and nerve compression syndromes. In order to accomplish this goal, we have increased our department's presence in the medical school curriculum through faculty and resident participation in gross anatomy lab, lectures, and problem-based learning sessions. We are further collaborating with the School of Medicine on initiatives such as the Anatomy Task Force, which is dedicated to innovating and integrating anatomy throughout the four years of medical school.

As every Penn Med student participates in the one-week Ortho 200 course, we have focused on this opportunity to teach them the fundamentals. The clerkship now features a problem-based learning curriculum, developed by rising PGY5 Ryan DeAngelis, with cases selected to introduce essential musculoskeletal concepts.

In the next academic year, my goal is to broaden our offering of musculoskeletal electives. The current Ortho 300 courses are all sub-internships: focused, immersive experiences intended for students who have decided to apply for orthopaedic surgery residency. The new electives will be designed for students who wish to gain more exposure to musculoskeletal medicine as they prepare for careers in specialties such as family medicine, emergency medicine, and pediatrics.

**2. Prepare students to apply, match, and succeed in orthopaedic surgery residencies.**

With the increasing competitiveness of our specialty, students benefit not only from clinical teaching, but also from research opportunities, guidance about

the application process, and general mentorship. The Ortho 300 sub-internships are excellent opportunities for students to experience a subspecialty in depth, develop relationships with residents and faculty, and gain support for their application. Additionally, in partnership with the Leo Leung Orthopaedic Society, we have started holding group advising sessions for students at critical times during the application process. Both faculty and residents participate in these gatherings, lending valuable perspectives on topics from selecting an away rotation, interviewing, and ultimately forming a rank list. Next, we will be developing a formalized near-peer mentoring network for our students.

**3. Promote an inclusive culture.**

We are all acutely aware of the staggering lack of diversity in the field of orthopaedic surgery. As the physicians of the future, medical students represent an opportunity to diversify the pipeline of orthopaedic surgeons. A welcoming attitude and inclusive culture are needed to help minority students feel that their unique attributes are valued. Given the widespread stereotypes about orthopaedic surgeons, students come to medical school with formed opinions about our field and whether they fit (or don't fit) within it.<sup>1</sup> As educators, we have the opportunity and responsibility to reverse these preconceived notions through our interactions with the students.

Our increased presence in the pre-clerkship curriculum, as described above, is an opportunity for us to demonstrate the diversity within our department as well as an inclusive attitude toward students. We are also fostering extracurricular engagement through the Leo Leung Orthopaedic Society and other student interest groups. So far this year, members of our department have collaborated with the Elizabeth Blackwell Society, the Association of Women Surgeons, the Agnew Society, and Penn Global Health. Our interactions with students who have not already selected orthopaedic careers is especially critical, as this will help counteract stereotypes and attract more diverse students to our field.

Lastly, with support from the department and the School of Medicine, we have created the Inclusive Orthopaedics Scholarship at Penn. Every year, this program will provide three visiting students from other medical schools with funding to offset the financial

burden of an elective rotation at Penn. Applicants are selected by members of the Culture Committee, with approval from the Vice Chair of DEI, on the basis of academic achievement and the unique perspectives that they would bring to our program. We are pleased to report that three very accomplished students have been selected as the inaugural Inclusive Orthopaedics scholars.

#### **4. *Develop residents as educators.***

For medical students, residents are compelling role models and valued teachers. Many residents are passionate about education, leading them to consider academic careers. The medical educator track, which is being introduced in 2022, is an opportunity to develop the skills and experience needed to launch a career in education. Residents will become familiar with principles of adult learning, as well as develop and execute research or quality improvement projects related to medical education. They will graduate with an understanding of how to advance in this career path and a portfolio that will make them competitive in the academic job market. They will also be better prepared to evaluate opportunities, negotiate for support, funding, and protected time, and begin practice with an intentional focus.

Developing resident educators will benefit medical students on many levels. The insight, ideas, and dedication that our residents already contribute will only be increased with the support of the Med Ed program. Moreover, the projects they undertake will grow the educational impact of our department on an annual basis.

As faculty and residents, we interact with medical students at a time when they are encountering their first patients, discovering the field of orthopedics, and deciding on their future careers. For many of them, this may be their first exposure to surgery: the process of physically opening the human body to address a problem. They often bring a beginner's mind and a sense of awe for the world that has become routine to us over the years. Teaching them is a refreshing reminder of that fascination, and an opportunity to pay forward the gifts we received from our own educators and mentors.

#### **Reference**

1. Gerull KM, Parameswaran P, Jeffe DB, *et al.* Does Medical Students' Sense of Belonging Affect Their Interest in Orthopaedic Surgery Careers? A Qualitative Investigation. *Clin Orthop Relat Res.* 2021 Oct 1;479(10):2239-2252.