



# Student-to-Student Lectureship in Musculoskeletal Education – A Case Report

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Despite the substantial and growing prevalence of musculoskeletal disease, traditional medical school curricula dedicate relatively little time to the subject. At the Perelman School of Medicine, fourth-year medical students prepared a series of four lectures to supplement the musculoskeletal training for fellow students of all years. Forty students completed an email survey distributed after the final lecture. They indicated that the current medical school curriculum is lacking in musculoskeletal content and desired an average of 13.5 hours per semester of additional exposure. Furthermore, respondents were enthusiastic about the lecture series, which they perceived as an enjoyable and educationally valuable supplement to their training. While this lecture series was a step in the right direction and will be repeated in subsequent years, further efforts are required in order to adequately prepare future physicians to address the ever expanding number of musculoskeletal complaints that they are likely to encounter during their careers.

Musculoskeletal complaints are extremely common in clinical medicine—they represent 15-30% of primary care and emergency department visits in the United States<sup>1</sup>, with over 30% of the population seeking care for musculoskeletal-related conditions each year<sup>2</sup>. As the population ages, the prevalence and severity of musculoskeletal disease is likely to increase<sup>2</sup>. As such, emphasis on musculoskeletal education in medical student training is crucial in producing the next generation of competent physicians.

Since the onset of the Bone and Joint Decade, there have been efforts to increase musculoskeletal education at the medical school level. Bernstein et al. demonstrated that the percentage of medical schools with a formal musculoskeletal curriculum increased from 47% to 83% between 2003 and 2010<sup>3</sup>. However, the amount of time spent on musculoskeletal curriculum is still not commensurate with the burden of musculoskeletal disease in the United States<sup>4</sup>. It is therefore not surprising that medical students do not feel adequately prepared to address musculoskeletal complaints<sup>1</sup>.

In response, student leaders of the Leo Leung Orthopaedic Society at the Perelman School of Medicine of the University of Pennsylvania produced a lecture series to supplement the current musculoskeletal curriculum among their classmates. The series consisted of four, hour-long clinical anatomy correlation sessions timed to coincide with the musculoskeletal portion of the first-year students' gross anatomy course. Medical students of all levels of training were encouraged to attend. Each of these interactive lectures was prepared and presented by medical students under the guidance of the group's faculty advisers.

This experience fostered relationships between students of all years as well as with

attending orthopaedic surgeons in a low-pressure environment. The course series covered anatomy, physical exam skills and common clinical complaints with a focus on applications of anatomical knowledge in the clinical and surgical setting. It consisted of individual lectures on the shoulder, hand, hip/knee, and spine/foot/ankle. Anatomy was reviewed in the context of radiographs and intraoperative images. Materials were presented systematically starting with bones, muscles and attachments, and progressing to nerves and arteries. Commonly asked questions from the operating room and outpatient clinics were posed to encourage integration of anatomic facts and clinical medicine.

The clinical conditions portion was constructed to familiarize students with commonly encountered complaints, encouraging students to think through problems while providing relevant history, physical exam, radiologic findings, and treatment plans. The information was presented in an interactive fashion to encourage students to generate their own differential diagnoses. Students were challenged to deduce the underlying pathophysiology and anatomic defects from clinical presentations. Lively discussion was encouraged and moderated by fourth-year students.

The focus then turned to physical exam skills. First, commonly used maneuvers were discussed, and their diagnostic purpose elucidated. These were then demonstrated on a volunteer medical student model. Next, students were divided into small groups to practice on each other. Fourth-year medical students were available to facilitate this process and to answer questions.

To assess the success of this initiative, a school-wide survey was distributed via email eight days after the final lecture. In total, 80 students

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attended the lectures and 40 (50%) responses were obtained. Of these respondents, 27% (10) attended one lecture, 24% (9) attended two lectures, 30% (11) attended three lectures, and 16% (6) attended all four lectures. Twenty, nine, seven, and four responses came from first, second, third, and fourth-year medical students, respectively.

In response to questions “Does the current curriculum include enough musculoskeletal content?” and “Should our school include more musculoskeletal content in the curriculum?” on a scale of one to five with one being “definitely no” and five being “definitely yes,” the average scores were 2.49  $\pm$  0.35 and 3.87  $\pm$  0.36 with 95% confidence. On average, an additional 13.5 hours per semester was desired, suggesting that students feel that the current medical curriculum includes too little musculoskeletal content.

In response to “How do you feel about the lecture series as an educational tool?” on a scale of one to five with one being “irrelevant” and five being “very useful,” the average score was 4.53  $\pm$  0.29 with 95% confidence. Attendee comments to lecture organizers included: “Keep doing this! I thought it was fantastic,” and “Keep chugging. You are all monsters.”

This survey was intended to broadly inform educators of the success of the lecture series and not to draw specific conclusions about medical training as a whole. However, results do suggest that exposure to musculoskeletal medicine in the traditional curriculum was perceived as insufficient. This is in accordance with more rigorous research which has demonstrated that students feel that they lack clinical mastery in musculoskeletal content<sup>1</sup>.

While this series received highly positive attendee reviews, it will continue to be improved. Increased resident and faculty involvement, for instance, will be incorporated into future iterations. In addition to providing invaluable feedback to students preparing lecture materials, these residents and faculty

members will be present as an informational resource to help answer questions after the formal presentations. Resident-led lectures may also be added to the existing programming. These modifications would promote collegiality throughout the medical hierarchy, foster research relationships, and provide role models for medical students interested in specializing in musculoskeletal-based disciplines.

In conclusion, a student-to-student lectureship series undertaken in order to address the dearth of musculoskeletal content in medical school education was met with much enthusiasm. A post-series survey suggested that medical students desire greater exposure to musculoskeletal content and feel that the current system is lacking in this area. While this extracurricular lecture series illustrates one strategy for increasing student exposure to musculoskeletal medicine, changes to the formal curriculum are necessary as well. In this manner, future graduates will be more comfortable and proficient addressing the ever-increasing volume of musculoskeletal complaints.

## REFERENCES

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