

Progress Report

The Prevalence of Required Medical School Instruction in Musculoskeletal Medicine at Decade's End

Joseph Bernstein MD, Grant Hoerig Garcia BA,
Jose Luis Guevara BA, Grant W. Mitchell BA

Received: 12 January 2010 / Accepted: 7 July 2010 / Published online: 4 August 2010
© The Association of Bone and Joint Surgeons® 2010

Abstract

Background In a 2003 report, required courses in musculoskeletal medicine were found in only 65 of the 122 medical schools in the United States. Since then, national efforts to promote musculoskeletal medicine education were led by the US Bone and Joint Decade, the American Medical Association, the Association of American Medical Colleges, the American Academy of Orthopaedic Surgeons, and the National Board of Medical Examiners, among others. Whether these efforts resulted in any changes in curricula is unclear.

Questions/purposes We assessed the change, if any, in the prevalence of required instruction in musculoskeletal medicine, which might be attributed to these reform efforts.

Methods Curriculum requirements were ascertained by an email survey sent to all 127 medical schools in the United States and from the schools' websites. The presence of a preclinical course or block dedicated to musculoskeletal medicine was noted. Likewise, the requirement for a

clerkship in a musculoskeletal discipline (comprising orthopaedic surgery, rheumatology, or physical medicine) was recorded.

Results One hundred of the 127 medical schools in the United States had required preclinical courses in musculoskeletal medicine. Among the schools without such a course, six had a required musculoskeletal clerkship. Thus, 106 schools had some requirement, with only 21 (17%) lacking required instruction in musculoskeletal medicine. This rate compares favorably with the 47% rate (57 of the 122 schools) reported previously.

Conclusion The prevalence of required instruction in musculoskeletal medicine is greater compared with the prevalence reported in previous studies. Musculoskeletal medicine appears to have attained a more prominent place in the curriculum at most schools.

Introduction

Although musculoskeletal conditions are among the most common in terms of disability, physician visits, and impairment, medical students apparently are ill-prepared in this area. Clawson et al. [5], in a large scale survey, found resident physicians lacked confidence with issues pertaining to musculoskeletal medicine. Freedman and Bernstein [7, 8] reported on the lack of cognitive mastery in musculoskeletal medicine, using a validated examination in an elite sample of recent graduates; their findings were replicated by numerous authors [10–12].

DiCaprio et al. [6] suggested a unifying cause for the lack of confidence and competence: a lack of instruction. In their study, they examined medical school curricula in the United States, looking for either a required course in musculoskeletal medicine during the preclinical years or as

Each author certifies that he or she has no commercial associations (eg, consultancies, stock ownership, equity interest, patent/licensing arrangements, etc) that might pose a conflict of interest in connection with the submitted article.

J. Bernstein
Department of Orthopedic Surgery, Veterans Hospital,
Philadelphia, PA, USA

J. Bernstein (✉), G. H. Garcia, G. W. Mitchell
Department of Orthopaedic Surgery, University of Pennsylvania,
School of Medicine, 424 Stemmler Hall, Philadelphia, PA
19104, USA
e-mail: orthodoc@uphs.upenn.edu

J. L. Guevara
University of Pennsylvania, School of Veterinary Medicine,
Philadelphia, PA, USA

Table 1. Organization efforts to improve education in musculoskeletal medicine

Organization (in alphabetical order)	Sample reform effort
American Academy of Orthopaedic Surgeons	Published the <i>Musculoskeletal Medicine</i> textbook for students
American Medical Association	In 2003, passed Resolution 310, which strongly urged medical schools “to make changes that ensure medical school students have the appropriate education and training in musculoskeletal care, and make competence in basic musculoskeletal principles a graduation requirement for medical school”.
Association of American Medical Colleges	Convened a Medical School Objectives Project panel, which issued a report to all schools defining the learning objectives for musculoskeletal medicine [2–4].
National Board of Medical Examiners	Created a Subject Examination in musculoskeletal medicine
United States Bone and Joint Decade	Obtained the endorsement of all medical school deans for a resolution asserting the schools’ commitment to advancing education, research, and patient care for bone and joint diseases.

Table 2. Distribution of required instruction in musculoskeletal medicine

Medical school curriculum requirements	Required clerkship in musculoskeletal medicine	No required clerkship in musculoskeletal medicine	Total number of schools
Required preclinical course in musculoskeletal medicine	25	75	100
No required preclinical course in musculoskeletal medicine	6	21 (no required instruction at all)	27
Total number of schools	31	96	127

a clerkship. They found that 57 schools (47%) had no required instruction in musculoskeletal medicine.

In response, national efforts for promoting musculoskeletal medicine education were led by the American Academy of Orthopaedic Surgeons, the American Medical Association, the Association of American Medical Colleges, the National Board of Medical Examiners, and the US Bone and Joint Decade (Table 1). Therefore, it is reasonable to reassess the distribution of required courses in musculoskeletal medicine, to contrast the current state to the baseline established by DiCaprio et al. [6] before the national reform. Although a causal link between any changes seen and the reformers’ efforts cannot be proven, it nonetheless may be interesting to examine whether their goals have been attained.

We therefore surveyed the state of education in musculoskeletal medicine to determine the prevalence of required preclinical courses and clerkships in musculoskeletal medicine in medical schools in the United States.

Materials and Methods

A list of the medical schools in the United States was composed from the website of the Association of American Medical Colleges [1]. At each school, the office of the Dean of Students (or a comparable post) was contacted by

email and asked to indicate whether the school had a distinct preclinical course in musculoskeletal medicine and whether there was a required clerkship in orthopaedic surgery, rheumatology, or physiatry, roughly approximating the method of DiCaprio et al. [6]. The presence of a course, but not its duration or content, was noted. Replies were received from 118 schools; and similar information was collected from the websites of the nine schools that did not respond to the survey. Using these methods, we were able to obtain the information for every school.

Results

A preclinical course in musculoskeletal medicine was required at 100 schools. A clerkship in musculoskeletal medicine was required at 31 schools, six of which did not have a required preclinical course. Thus, some form of instruction in musculoskeletal medicine was required at 106 of the 127 schools (Table 2).

Discussion

In a 2003 report, required courses in musculoskeletal medicine were said to be present in only 53% (65/122) of medical schools in the United States [6]. Using similar

Table 3. A comparison between medical school curricular requirements

Medical school curriculum requirements	DiCaprio et al. [6]* (2003)	Current study
Required preclinical course in musculoskeletal medicine	42% (51/122)	79% (100/127)
Required clerkship in musculoskeletal medicine	20% (25/122)	24% (31/127)
No required instruction at all	47% (57/122)	17% (21/127)

* Figures are reported as percentages, as there now are 127 medical schools; there were only 122 at the time of the previous study.

methods, we found that 83% (106/127) of medical schools now have required courses in musculoskeletal medicine (Table 3).

There are limitations to this study. First, the method introduced by DiCaprio et al. [6] and approximated here by its nature fails to capture the precise content of the curriculum. It certainly is possible that schools which have no required courses in musculoskeletal medicine still teach the subject extensively. Even in schools without a distinct course in musculoskeletal medicine, students will be exposed to patients with back pain (in family medicine clerkships), osteoporosis and arthritis (on the internal medicine service), and trauma and fractures (during surgery rotations). At the other extreme, our methods may give too much credit: some schools that do require musculoskeletal medicine may not teach the subject well. Because we accounted for neither the duration of instruction nor its quality, complete credit would be given even to ineffective courses rightly described as “solitary, poor, nasty, brutish, and short”, to use Hobbes’ phrase [9]. Second, increased instruction for musculoskeletal medicine is not tantamount to increased learning and increased quality of care. Although the argument relating instruction to learning and, in turn, to performance has intuitive appeal, it remains unproven. Additionally, it has been suggested that material learned later in training is better retained [11]. Thus, residency training may more than compensate for deficits encountered in medical school. Third, because our data were pooled from survey responses and website analyses, it is possible our findings might not perfectly match those found from a pure survey (although that factor is likely to be small, as data from only 7% of the sample [nine schools] were collected from the Web).

Additionally, there is a possibility that the progress reported here is simply a matter of repackaging. Some schools may have aggregated existing teaching sessions into newly labeled courses in musculoskeletal medicine—all the while making no change to the curricular content. Of course, one could say that even repackaging represents progress. If nothing else, the designation of a topic as worthy of distinction may elevate it in the eyes of students and evoke a better learning effort from them. Unified courses also may enhance opportunities for

faculty development and the creation of instructional materials.

It appears that some of the curricular deficit identified previously by DiCaprio et al. [6] has been closed. That is not to say that the work of the reformers is necessarily responsible for this progress (for only a temporal association, not a causal link, was shown), and it certainly is not to say that the work of reformers is complete. To the contrary, the era of true toil has just begun: now that musculoskeletal medicine is taught explicitly at most schools, the enduring challenge is to ensure that it always is taught well.

References

1. Association of American Medical Colleges. Available at <http://www.aamc.org/>. Accessed July 6, 2010.
2. Association of American Medical Colleges. Medical School Objectives Project. Report VII. Contemporary issues in medicine: musculoskeletal medicine education. 2005 Sep.
3. Bernstein J, American Academy of Orthopaedic Surgeons., American Academy of Family Physicians., American Academy of Pediatrics. Musculoskeletal medicine. 1st ed. Rosemont, Ill.: American Academy of Orthopaedic Surgeons; 2003.
4. Bernstein J, King T, Lawry GV. Musculoskeletal medicine educational reform in the bone and joint decade. *J Bone Joint Surg Am.* 2007;89:2308–2311.
5. Clawson DK, Jackson DW, Ostergaard DJ. It’s past time to reform the musculoskeletal curriculum. *Acad Med.* 2001;76:709–710.
6. DiCaprio MR, Covey A, Bernstein J. Curricular requirements for musculoskeletal medicine in American medical schools. *J Bone Joint Surg Am.* 2003;85:565–567.
7. Freedman KB, Bernstein J. Educational deficiencies in musculoskeletal medicine. *J Bone Joint Surg Am.* 2002;84:604–608.
8. Freedman KB, Bernstein J. The adequacy of medical school education in musculoskeletal medicine. *J Bone Joint Surg Am.* 1998;80:1421–1427.
9. Hobbes T. *Leviathan*. In: Gaskin JCA, ed. New York, NY: Oxford University Press; 2009.
10. Lynch JR, Schmale GA, Schaad DC, Leopold SS. Important demographic variables impact the musculoskeletal knowledge and confidence of academic primary care physicians. *J Bone Joint Surg Am.* 2006;88:1589–1595.
11. Matzkin E, Smith EL, Freccero D, Richardson AB. Adequacy of education in musculoskeletal medicine. *J Bone Joint Surg Am.* 2005;87:310–314.
12. Schmale GA. More evidence of educational inadequacies in musculoskeletal medicine. *Clin Orthop Relat Res.* 2005;437:251–259.