

Gendered Innovations in Orthopaedic Science

Gendered Innovations in Orthopaedic Science: Title IX Education: Book Learnin' and Bone Mendin'

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The heft of the hammer; the thrill of the drill — for many of us, hands-on experience opened the window to a career in orthopaedic surgery, and the opportunity for scientific investigation beyond the walls of the operating room. Yet, today's medical students rarely have the educational opportunity to explore and experience orthopaedic surgery unless they have had an early, outside introduction. This “too little, too late” concept is at the heart of a playing field with little diversity. Lack of exposure at school, along with cultural mores

and prepackaged notions of orthopaedic jock-docs, inhibit many from ever entering the operating room other than a required click through general surgery [1]. That 70% of medical schools do not require a musculoskeletal clinical clerkship only undermines this opportunity [8].

Education is the heart of Title IX. Representing a small part of the Education Amendments of 1972, Title IX as appended to the 1964 Civil Rights Act prohibited discrimination based on sex in “any educational program or activity receiving Federal financial

assistance.” [24] The landmark 1964 legislation outlawed discrimination based on race, color, religion, sex, or national origin and addressed the workplace, voting registration, segregation in schools, and public facilities, but did not specifically address education [3]. Passage of the Civil Rights extension law made previous practices of prohibiting women in professional schools — and thereby professions — illegal.

Fast-forward 40 some years: American educational institutions have hugely benefited, especially as it relates to professional schools, with enormous impact in the business world. Growth in professional fields (high-paying jobs like law, dental, and medicine) went from less than 10% in 1972 to almost 50% after Title IX [18]. The previously unwritten and undocumented concept of sexual harassment is now illegal. Today, Title IX is synonymous with athletics if media coverage, including controversy, is any indication [14]. Eighty percent of Fortune 500 female managers cite having a sports background [22]; just ask any former jockette about improved self-confidence and leadership skills, let alone health benefits that

Note from the Editor-in-Chief:

We are pleased to present to readers of Clinical Orthopaedics and Related Research® the latest installment of “Gendered Innovations in Orthopaedic Science” by Amy L. Ladd MD. Dr. Ladd is a Professor in the Department of Orthopaedics at Stanford University, and is the Past-President of the Ruth Jackson Orthopaedics Society. She provides commentary on sex and gender similarities and differences in orthopaedics. This column is the second of a two-part series on Title IX. The first part discussed athletics; the second part of the series will emphasize education.

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Gendered Innovations in Orthopaedic Science

sports bring to their professional lives. The impact on sports has forever changed our discipline — how we treat ACL injuries, shoulder instability, analysis of pitching styles of softball compared to baseball, are but a few examples. These are big strides, indeed.

Despite this feel-good enthusiasm, the recent words of C. McCollister “Mac” Evarts MD at the 2014 Ruth Jackson Orthopaedic Society annual meeting have remained with me. Paraphrasing a 1968 Virginia Slims cigarette commercial touting the progress of women [11] (however misguided, in retrospect), Dr. Evarts reflected on the current standstill state of women in orthopaedics, as well as musculoskeletal education in general: “You’ve come a long way baby — but still a long way to go.” Title IX seems to be in a similar impasse — stalled at the brink of Lyndon Johnson’s Great Society, offering hope and platitudes in a “times they are a-changin’” sort of way, with the action and delivery on a variety of educational initiatives still unrealized.

A greater representation of women at the highest professional levels of business and the sciences, such as chief executive officers, tenured professors, and deans has not come to fruition [26]. Only 12% of Silicon

Valley’s engineers are women [17]. Given current rates of achievement, women will not attain top-shelf positions till the year 2085 [26]. In our own specialty of orthopaedic surgery, the statistics are, well, abysmal. Orthopaedics fares worse than any other specialty in medicine in attracting women, and worse than anything in business. Women make up 4% of the US board certified orthopaedic surgeons and 13% of orthopaedic residents [25], unchanged in the 30 years since Mac Evarts advocated, pleaded, and led the way amongst orthopaedic chairmen to enlist the half of humanity who had something to give.

What happens to those women who represent more than 50% of those who matriculate into medical school, and why do so few pursue orthopaedics?¹ How can urology beat us, once the domain of aging prostates and undescended testicles? Twenty-five percent of urology residents are now women, mirroring the better science and treatment of women’s genitourinary conditions [5]. And honestly, how can neurosurgery fare better, that killer of lifestyle and reproductive years?

Several of our colleagues independently report that the culture of orthopaedics and lack of exposure steer women away [6, 7, 12, 13, 25].

The jock mentality, the long hours, and the inflexibility with lifestyle and childbearing — you have heard them all. Throw in lack of mentors, to boot. And how pitiful that many programs have never admitted a woman [25] — if you are one of those programs, we need you most! We need champions across our residencies and medical schools to promote and recruit women, and sheer numbers alone will dispel the myths and the mores.

We can also do a better job across the board in educating our society, government, and our patients on the prevalence and cost of musculoskeletal conditions. These conditions represent 20% of primary care visits, 30% of Emergency Room (ER) visits, and are the principal cause of work-related disability [19, 23]. Primary care and ER practitioners feel ill equipped to handle musculoskeletal problems [4]. Curiously, the musculoskeletal system is not a defined organ system in the current Liaison Committee on Medical Education standards for medical school curricula. This lack of definition poses a challenge for advocacy [16]. But the simplest thing we can do is help implement musculoskeletal education as a required preclinical component and a clinical clerkship, and thereby accomplish early exposure [2, 6].

¹ I hesitate to use the current favored term for this group as the “best and the brightest,” given its reference to the educated elite whiz kids of the Kennedy administration whose brilliant strategies created disastrous consequences in Vietnam [10].

Gendered Innovations in Orthopaedic Science

Even better, start 'em early. Plenty of evidence exists outside of orthopaedics. President Obama's 2009 Educate to Innovate program [20] targets underrepresented minorities and girls with science, technology, engineering, and mathematics initiatives — and is but one example that if you introduce programs early, more kids will go into the hard sciences, no matter what their background. The Perry Outreach program [21], founded in honor of the inimitable Jacquelin Perry [9], does exactly that. Bioengineers and orthopaedic surgeons serve as lab instructors and for some, become their mentors. There is nothing like watching a smart-but-timid 15-year-old young woman's eyes light up when she's drilled and reconstructed an ACL. A crystallizing moment of discovery is born: Hands-on science is fun! The Perry Outreach program has reached more than 41% of underrepresented minority women in targeted communities since its inception in 2009, and more than 80% graduates from the program are pursuing science majors in college. The early matriculating medical students overwhelmingly choose orthopaedics as their preferred specialty. Pre and post-surveys indicate a marked change in perception of diversity, lifestyle, and physical demands [15]. What a fabulous way to chip away at the odds.

Whether it is with Title IX, musculoskeletal curricula, or the participation

of women in orthopaedic surgery and orthopaedic science, education remains the catalyst for discovery and opportunity. It is time for us to shrug off the stalled sense of complacency and gather momentum to walk, run, and jump toward educational progress.

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References

- Bernstein J, DeCaprio MR, Mehta S. The relationship between required medical school instruction in musculoskeletal medicine and application rates to orthopaedic surgery residency programs. *J Bone Joint Surg Am.* 2004;86:2335–2338.
- Bernstein J, Garcia G, Guevara J, Mitchell G. Progress report: The prevalence of required medical school instruction in musculoskeletal medicine at decade's end. *Clin Orthop Relat Res.* 2011;469:895–897.
- Civil Rights Act of 1964, Pub.L. 88–352, 78 Stat. 241 (1964).
- Comer GC, Liang E, Bishop JA. Lack of proficiency in musculoskeletal medicine among emergency medicine physicians. *J Orthop Trauma.* 2014;28:e85–87.
- Darves B. The NEJM Career Center: Demographics continue to shift, albeit slowly in some areas, and certain disparities persist. Available at: <http://www.nejmcareercenter.org/article/women-physicians-in-the-specialties-making-gains/>, Accessed May 6, 2014.
- Day CS, Ahn CS, Yeh AC, Tabrizi S. Early assessment of a new integrated preclinical musculoskeletal curriculum at a medical school. *Am J Orthop (Belle Mead NJ).* 2011;40:14–18.
- Day CS, Bernstein J, Boyer MI. Educating medical students in musculoskeletal surgery and medicine—how to get a course up and running at your institution: AOA critical issues. *J Bone Joint Surg Am.* 2012;94:e1761–e1766.
- DeCaprio MR, Covey A, Bernstein J. Curricular requirements for musculoskeletal medicine in American medical schools. *J Bone Joint Surg Am.* 2003;85:565–567.
- Festino J. Giants in orthopaedic surgery: Jacquelin Perry MD, DSc (Hon). *Clin Orthop Relat Res.* 2014;472:796–801.
- Halberstam D. *The Best and Brightest.* New York, NY:Random House; 1972;720.
- Horrigan B. The 1968 Exhibit: “You’ve Come a Long Way” campaign launched July 22, 1968. Available at: <http://the1968exhibit.org/covering-1968/2011-07/youve-come-long-way-campaign-launched-july-22-1968>. Accessed May 4, 2014.
- Jagsi R, Griffith KA, DeCastro RA, Ubel P. Sex, role models, and specialty choices among graduates of US medical schools in 2006–2008. *J Am Coll Surg.* 2014;218:345–352.

Gendered Innovations in Orthopaedic Science

13. Johnson AL, Sharma J, Chinchilli VM, Emery SE, McCollister Evarts C, Floyd MW, Kaeding CC, Lavelle WF, Marsh JL, Pellegrini VD Jr, Van Heest AE, Black KP (2012) Why do medical students choose orthopaedics as a career? *J Bone Joint Surg Am.* 94:e78.
14. Ladd AL. The sports bra, the ACL, and Title IX — The game in play. *Clin Orthop Relat Res.* 2014;472:1681–1684.
15. Lattanza L. Faculty development course 11: The Anatomy of diversity: Where are the women? Why does that matter? Talk presented at: American Academy of Orthopaedic Surgeons 2014 Annual Meeting; March 11–15, 2014; New Orleans, LA.
16. Liaison Committee on Medical Education. LCME standards and publications. Available at: <http://www.lcme.org/publications.htm>. Accessed April 4, 2014.
17. McFarland M. Silicon Valley's gender imbalance, in one chart. Available at: <http://www.washingtonpost.com/blogs/innovations/wp/2014/02/14/silicon-valleys-gender-imbalance-in-one-chart/>. Accessed February 18, 2014.
18. Musil CM. Scaling the ivory towers. Available at: <http://www.feminist.org/education/TriumphsOfTitleIX.pdf>. Accessed May 5, 2014.
19. National Center for Health Statistics. Health, United States, 2008 with special feature on the health of young adults. Available at: <http://www.cdc.gov/nchs/data/hus/hus08.pdf>. Accessed May 7, 2014.
20. Office of Science and Technology Policy. Women in STEM. Available at: <http://www.whitehouse.gov/administration/eop/ostp/women>. Accessed May 8, 2014.
21. Perry Outreach Program. Available at: <http://perryinitiative.org>. Accessed May 1, 2014.
22. Sandberg K, Verbalis JG. Sex and the basic scientist: Is it time to embrace Title IX? *Biol Sex Differ.* 2013;4:13.
23. The Burden of Musculoskeletal Diseases in the United States. Available at: <http://www.boneandjointburden.org>. Accessed May 5, 2014.
24. United States Department of Labor. Title IX, education amendments of 1972. Available at: <http://www.dol.gov/oasam/regstatutes/titleix.htm>. Accessed March 19, 2014.
25. Warner J. The women's leadership gap. Women's leaders by the numbers. Available at: <http://www.americanprogress.org/wpcontent/uploads/2014/03/WomenLeadership.pdf>. Accessed May 5, 2014.
26. Van Heest AE, Agel J. The uneven distribution of women in orthopaedic surgery resident training programs in the United States. *J Bone Joint Surg Am.* 2012;94:e9.