



CORR Curriculum — Orthopaedic Education

CORR® Curriculum — Orthopaedic Education: Developing Safe, Independent Practitioners

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Introduction

A recent survey of orthopaedic surgery residents and residency program directors found that only 56% of residents and 17% of program directors believed that graduates were prepared to function as

attending surgeons [9]. These numbers are a major concern. The most important role of a residency program director is to confirm that upon graduation, residents have the skills to practice independently. Yet, there is dissonance between program directors' endorsements of each year's crop of graduates and the survey result, suggesting that most of those program directors have serious questions about graduates' preparedness. What is behind this discord?

Progressive responsibility and autonomy are tenets of graduate medical education. But external pressures on surgeons to increase output has placed a premium on efficiency. Teaching inexperienced residents through procedures is a high-intensity, but low-efficiency task, and economic incentives are stacked against program directors [1, 14]. Additionally, reforms focused on

fighting resident fatigue—duty-hour restrictions and increased requirements for faculty supervision in the operating room—remains controversial [2, 15]. Have these changes improved safety, or have they simply imposed limits on the surgical education of our residents? Have they both improved safety even as they have diminished our ability to educate residents? We are only beginning to see the kinds of research that will help us answer these complicated questions [3, 7–9].

Considering the troubling statistics cited in the recent survey, perhaps it is time to reasonably restructure the orthopaedic residency program in a way that acts in accordance with the Accreditation Council for Graduate Medical Education (ACGME) duty-hour guidelines, while also offering residents the autonomy to develop as an orthopaedic surgeon.

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Trends in Residency Programs

One of the trends we are seeing as we examine the current state of orthopaedic residency programs is the adoption of new surgical training tools. As orthopaedic education has evolved,

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more residents are training outside the operating room. This is, in part, due to the recently implemented resident work-hour restrictions [18]. Surgical skills training labs, and simulator-based models are now the norm. When residents are in the operating room, they have more mandatory faculty involvement and direct supervision while performing procedures [18]. What effect does this have on patient safety and quality when compared to those with faculty-only surgical procedures [7]? Perioperative complications do not appear to be influenced by resident involvement [7, 10, 12, 19]. This is also the case in other countries [8].

Another trend we found is the reliance on shorter subspecialty rotations. While the ideal rotation length has not been established, there is a difference between a 6-month and a 6-week rotation. We believe that smaller residencies and longer rotations allow for a greater opportunity for faculty and residents to work more closely together for longer periods of time. This increased interaction will allow attendings to recognize the strengths and weaknesses of each resident, provide feedback, and as confidence builds, permit more autonomy in the operating room. Restructuring a residency program without lengthening the residency itself, may allow for better education and better prepared

graduates. But is restructuring an entire residency program feasible or realistic? One solution might be to have a prescribed length of rotation for certain essential resident rotations, such as those most associated with the Milestones topics. This would offer flexibility with other rotations, and allow for shorter elective rotations. Additionally, this type of restructuring would be cost-effective since most rotations would remain the same length but an adult reconstruction rotation, for example, could be a minimum of 3 months.

Solutions to Improve Transition for All Residents

Earlier Operative Experience

With the present configuration of residency programs, the greatest demonstration of skills generally occurs later in the residency program (usually PGY4/5 years). Allowing for greater exposure and “hands on” experience earlier in the course of the residency might allow for even better surgical skills later in the residency program. The American Board of Orthopaedic Surgery (ABOS) moved toward this direction when it mandated intern surgical skills modules for all PGY1 residents beginning in the 2013–2014 year [6]. Regarding how

we teach our residents, surgical simulation in the laboratory may accelerate the identification of those who need extra attention to develop certain surgical skills [13].

Fellowships

The subspecialization of orthopaedic surgery has added a new dimension for education [5, 11, 16]. Fellowships act as a bridge, softening the transition from resident to independent practitioner. More residents are taking on a fellowship immediately after graduation. In 2003, 76% of residents taking the ABOS Part II certifying examination reported having a fellowship. In 2013, that number increased to 90% [4, 11]. Residents believe fellowships can enhance their marketability, and improve their job opportunities. Many want to become experts in a particular subspecialty field or for the opportunity to gain more clinical experience. Fellowships generally allow for more operative experience (but not always) and autonomy in patient care. We agree that fellowships are part of a solution to this dilemma, allowing for continued education in a mentored setting. The fact that 90% of those candidates taking the 2013 ABOS Part II certifying examination reported fellowship training shows that the additional year of education is desirable.

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Postgraduation Transition to Practice Year

The transition to practice could also be accomplished by allowing residents to remain as faculty for an additional year with independent privileges. This would require the presence of senior faculty who would take on a mentoring role, assisting with more complex cases. While this model would not work for every graduate, (there would need to be sufficient volume for an independent practitioner) it could allow for a transition to practice in a well-mentored setting. Using this program in conjunction with subspecialty fellowships, could allow for a greater number of graduates to gain additional experience.

Increased Autonomy

One way to be better assured that graduates are ready to undertake independent practice is to allow for greater responsibility and autonomy, within the current constraints of graduate medical education. As mentioned earlier, longer rotations allow for better education, assessment and mentoring.

While it is difficult in today's environment to allow for the autonomy seen in previous generations, there are some solutions. Changing a rotation schedule to allow for longer rotations is possible with those rotations that are

more frequent (a resident may rotate on that specific rotation more than once). By doubling the length in consolidating rotations one can allow for increased rotation time of specific rotations. Another solution for programs that have shorter duration rotation cycles would be to have residents choose an "extended" rotation or "mini-fellowship" in their senior year with a subspecialty of their choice.

While these solutions might not work with all subspecialty rotations, having one or two longer rotations of a sufficient length of time, particularly in the senior years would allow for better assessment, provide opportunities for increasing responsibility, as well as mentoring and remediation. It is critical that the longer rotation is coupled with faculty mentorship, allowing for a residents development in a more ideal setting. Having faculty who are willing to spend more time with an individual resident on a longer rotation as part of initiating this program.

Recommendations

We perceive a real concern that among residents, the gap between expected performance and actual performance has increased in the last 20 years [9, 17]. Given the alarming statistics regarding resident preparedness [9], we believe a reasonable restructuring

of residency programs should be considered. We recommend (1) developing rotations with a sufficient and standardized length, along with better faculty mentoring, (2) increasing the use of surgical simulation, particularly for more the common procedures, (3) encouraging the pursuit of a fellowship (as most residents are pursuing them anyway), and (4) incorporating a postgraduation year to allow for transition to practice. Programs need to critically review the needs of recent graduates. One or all of these solutions could potentially increase resident experience and cultivate a more capable practicing orthopaedic surgeon upon graduation.

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