***CORR* Insights®: Does Research Participation Make a Difference in Residency Training?**

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Where Are We Now?

Training in orthopaedics is based on three noble therapeutic traditions: that of the physician, that of the surgeon, and that of the bone-setter/brace-maker. Often, these traditions work in harmony. For example, the treatment of osteoarthritis includes medications, physical therapy, or operative intervention, each chosen according to the patient's particular needs. There are even instances where one patient may benefit from all three modes in one episode of care: the management of septic bursitis of the knee (drainage, followed by antibiotics, and an immobilizer), to name one, is informed by the wisdom of the physician, the surgeon, and the brace-maker.

Each tradition exerts its own pull, and there are conditions for which one approach or another seems to be ascendant — medical management for osteoporosis, with

surgical fixation for hip fractures and manipulation for clubfoot, for example. Still, the traditions are mostly complementary, not antagonistic.

Training in orthopaedics is based also on two noble didactic traditions: that of the scholar and that of the apprentice. Yet as Ludmerer [4] noted, in residency there is “tension between education and service, between university ideals and apprenticeship traditions.”

If the tension between the didactic traditions can be seen as an argument on values, it is clear that the university ideal has won the rhetorical debate. Nevertheless, it is the apprenticeship tradition that has triumphed on the ground. On a minute-to-minute basis, clinical work in residency outpaces scholarly work by at least a factor of ten. The supremacy of the apprenticeship model is implicit in the Accreditation Council for Graduate Medical Education (ACGME) 80-hour work week limitations — rules that consider “reading, studying, and academic preparation time” [1] to be so marginal that they are exempted from consideration.

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Where Do We Need To Go?

Given the demands of clinical practice, it is not hard to imagine residency inevitably consumed by service tasks, to the exclusion of scholarly efforts. That being said, a residency program regimen dominated by scholarly activity is not right either. After all, there is a lot to learn in the clinics and in the operating room. Rather, the goal must be to maintain a dynamic equilibrium between scholarship and apprenticeship. And just as the intracellular concentration of sodium is maintained only by the exertion of active membrane pumps, residency programs maintain this equilibrium and thereby cultivate their academic roots only with explicit effort.

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It may be asked, how much effort is the right amount of effort. Should all programs emulate the Case Western example?

One argument can be made that with so many applicants seeking orthopaedic surgery residency positions (implying that the “price” of admission can be raised substantially) it may be possible to demand a full, doctoral-level thesis from all. At the other extreme, the argument could also be made that serious investigative research should be conducted by only those with a passion for it — high quality research is never produced by the unwilling.

I submit that, at the least, all orthopaedic surgery residents must gain firsthand experience of how high quality scholarly activities are conducted. This effort is not undertaken in a quest to make residents into scholars, per se, but to make them better surgeons. The Talmud (Avot 3:21) teaches “without work there is no study, and without study there is no work.” Theoretical and practical training reinforce each other. As such, if we want to ensure that tomorrow’s orthopaedic surgeons will not mindlessly install whatever piece of hardware handed to them, we must ensure that they are critical thinkers today.

How Do We Get There?

I propose that the ACGME “exposure to research” requirement should be satisfied by a resident crafting — but not necessarily executing — a detailed research protocol applied to a specific topic of interest. This corresponds, roughly, to composing the *Introduction* section of a paper written in the mode of Dr. Richard A. Brand [2], Editor-in-Chief Emeritus of *Clinical Orthopaedics and Related Research*®. Specifically, to satisfy this requirement, the resident will be required to produce a document that critically states the issues at hand; formulates a question, and provides a rationale for it; reviews previously reported work; addresses controversies in the literature; asserts a hypothesis; and defines methods that can test that hypothesis. Not one datum of “results” needs to be collected. Rather, the emphasis will be on the rigor with which the question is articulated and the validity of the methods proposed to tackle it.

Such an approach will not only hone the residents’ thinking, it will prepare them for research when they begin practice — even community practice. James D. Heckman MD, Editor Emeritus of the *Journal of Bone and Joint Surgery*, noted that his journal “published many high quality clinical research studies which were not conducted

at academic centers, but rather were performed by individual orthopedic surgeons in private practice” [3]. He further noted that research by community surgeons “may provide the best way to tackle the large number of clinical questions that currently exist ... [and] while this effort would be of enormous benefit to our knowledge base, it would also add a dimension to the clinical practice of orthopedics that would be very rewarding to the individual practitioner” [3].

A requirement that residents produce a validated research protocol in residency is a good way to ensure that all residents are poised to contribute to our collective knowledge later in their careers, regardless of the mode or venue of those careers.

Maintaining a balance between scholarship and apprenticeship is a worthy goal for residency programs. A residency program dominated by scholarly activity is neither feasible nor desirable. Still, scholarly activity in the residency is essential for the educational development of the resident. The form of such scholarly activity could be a dedicated year in the lab. As shown by Macknin and colleagues, a year in the lab produces admirable results — not only for the research residents themselves, but for all residents in the program.

So kudos to Case Western University for maintaining its research track. Thanks must also be given to organizations and donors who support this effort. Last, congratulations are due to the residents who have honored the investment in them. The efforts at Case Western help maintain the viability of our scholarly traditions.

Nonetheless, the Case Western approach is not for everyone. Interpreting the requirement for research in terms of what I call “the Brand-Heckman ideal” guarantees that the appropriate mindset and skill set are acquired by all.

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