Letter to the Editor

Letter to the Editor: Editorial: Transition From Training to Practice – Is There a Better Way?

Rachel M. Frank MD, Aaron G. Rosenberg MD,
Andrew R. Hsu MD

To the editor,

We read your editorial [5], as well as the followup commentary provided by Dr. Jaimo Ahn [1], with great interest. We found the ideas and opinions insightful and stimulating. We hope to continue this discussion regarding training strategies within the ortho-

paedic community by adding our thoughts on the concepts of both competency and mastery with respect to surgical skills.

Understanding, let alone improving, the transition from trainee into practitioner is complex and multifaceted. As elegantly highlighted by Dr. Leopold, while one's title may change upon graduation from residency, there is no magical moment at which a new attending is able to perform an operation independently and with mastery. Not when 1 day (or 1 week, 1 month, or even 1 year) prior, that same individual needed supervision to perform that same operation.

In the current Accreditation Council for Graduate Medical Education (ACGME) milestones-based training system, the change in one's title has certainly not been shown to have any correlation with one's competency, let alone mastery, of a given skill. A competency-based training system, as suggested by Dr. Ahn [1], appears more reasonable: Allowing surgeons-in-training to become independent when they have proven themselves competent. In simple terms, isn't this how we would want our family members treated – by a surgeon who is competent, regardless of whether he or she is 1 day, week, or decade out of

training? The question then becomes, is our goal in surgical residency training, fellowship, and beyond to produce surgical competency in the general skills required in orthopaedic surgery, or to strive for potential mastery of these skills? Is mastery even possible in our specialty or is it an illusion constantly redefined by the evolving nature of our work?

The concept of achieving mastery or expertise in a given subject, including surgery, [3, 6] has been examined both conceptually and scientifically. Beginning with the 1993 analysis of the practice habits of violin students by Ericsson et al. [2], the theory of needing 10,000 hours (a decade of training) of “deliberate practice” to achieve a level of expertise was established. In 2008, author Malcolm Gladwell popularized this concept for audiences at large in his book [4] describing the so-called “10,000-hour rule” and its association with elite performance in multiple arenas.

Ericsson's study, coupled with Gladwell's book, made us wonder: What does it take to achieve a level of competency in an orthopaedic procedure, such that the trainer can feel comfortable with the trainee standing alone in the operating room, with our mother, father, brother, sister, or child

(RE: Leopold SS. Editorial: Transition From Training to Practice – Is There a Better Way? *Clin Orthop Relat Res*. 2014;472:1351–1352.) Each author certifies that he or she, or any member of his or her immediate family, has no funding or 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. All ICMJE Conflict of Interest Forms for authors and *Clinical Orthopaedics and Related Research*® editors and board members are on file with the publication and can be viewed on request. The opinions expressed are those of the writers, and do not reflect the opinion or policy of *CORR*® or the Association of Bone and Joint Surgeons®.

R. M. Frank MD (✉),
A. G. Rosenberg MD, A. R. Hsu MD
Department of Orthopaedic Surgery,
Rush University Medical Center,
1611 W west Harrison Ave, Suite 300,
Chicago, IL 60612, USA
e-mail: rmfrank3@gmail.com

Letter to the Editor

on the operating table? Is it 10,000 hours of residency training? For a resident in a standard 5-year orthopaedic program working an 80-hour work week, even when discounting internship and assuming 4 weeks of vacation per year, more than 15,000 hours of training is accomplished before graduation – far exceeding the 10,000 hours “required” to achieve mastery as noted by Ericsson and Gladwell. These numbers are deceiving. Despite demonstrating that most residents will have achieved greater than 10,000 training hours before graduating, this time is distributed acquiring several different skills in environments that are often far from truly educational. Of these hours, what is the proportion spent actually learning or improving the skills required to perform independently as a surgeon? From a learning perspective, is the length of time spent more important than other qualities inherent in the activity? What about the multiple factors involved in functioning as an independent surgeon; gaining surgical dexterity, learning indications for surgery, relevant surgical anatomy, and perioperative care, including how to recognize and manage complications? In other words, what proportion of the resident’s 15,000 + hours would fall under Ericsson’s definition of “deliberate practice?” [2].

We argue that the 10,000 hour rule does not apply to the surgeon. While many skills require 10,000 hours to achieve mastery, as surgeons, we appear to require the same amount of time just to achieve competency. Mastery in surgery may never be attainable, and this is an inherent paradox in what we do. Overall, we feel that achieving mastery as a surgeon is essentially a platonic goal – it is something we strive for, but likely cannot achieve, even with countless hours of “deliberate practice.” The factors that go into making a truly high quality surgeon are multifactorial, requiring both surgical and nonsurgical skills (perioperative care, bedside manner, complication management, etc ...), and the definition how (or when) one achieves mastery at any of these individual skills, let alone all of them, is not well-understood. Medicine seeks to constantly reinvent itself and improve treatment approaches, and new skills are always being developed and established as surgical approaches, instrumentation, and implants are continuously undergoing improvement. Our field is a moving target, and so we find ourselves constantly attempting to chase new measures of competency.

To counteract this, meaningful incorporation of simulation training into residencies and fellowships may

present a readily available solution. For example, while clearly no orthopaedic resident has scrubbed on 1000 total hip arthroplasties before getting to do his or her first case as an attending (in fact, the ACGME minimum case requirement for THA before graduation is a mere 30), with appropriate training, that surgeon can visualize the case and mentally work through the steps 1000 times. While nothing can replace the skills acquired in the actual operating room, we suggest that simulation training may allow trainees to take such mental exercise, and translate them into tangible muscle memories that can both help guide young surgeons into practice and improve patient care and surgical performance. Simulation training may well serve as a reasonable bridge for residents and fellows as they transition into practice. With restrictions on work hours combined with external factors (ie, billing obligations) limiting our trainees’ hours of “deliberate practice” on actual patients, hours spent with simulator training may allow young surgeons to address their shortcomings, while also building their confidence and abilities before entering practice.

Although logging 30 THA cases through the course of a 5-year residency program may be used as a benchmark to deem us competent, we

Letter to the Editor

have a more important need to embrace a lifelong dedication to learning and skill evolution in order to continuously improve our skillsets, let alone obtain a level of mastery. Certainly, no perfect solution exists, but perhaps simulation training is an ideal way to increase our volume of “deliberate practice” during training (and beyond), such that we come one step closer to approaching the level of mastery. It is possible that mastery in surgery is better defined as a persistent, unwavering dedication to constantly improve one’s skill set through

research, independent learning, and pushing the boundaries of the field to develop new techniques, implants, and procedures.

References

1. Ahn J. Letter to the Editor: Editorial: Transition from training to practice - Is there a better way? [Published online ahead of print June 21, 2014]. *Clin Orthop Relat Res*. DOI: [10.1007/s11999-014-3729-0](https://doi.org/10.1007/s11999-014-3729-0).
2. Ericsson KA, Krampe RT, Tesch-Römer C. The role of deliberate practice in the acquisition of expert performance. *Psychol Rev*. 1993;100:363–406.
3. Gélinas-Phaneuf N, Del Maestro RF. Surgical expertise in neurosurgery: Integrating theory into practice. *Neurosurgery*. 2013;73 Suppl 1:30–38.
4. Gladwell M. *Outliers: The Story of Success*. New York, NY: Little, Brown, and Company; 2008.
5. Leopold SS. Editorial: Transition from training to practice—is there a better way? *Clin Orthop Relat Res*. 2014;472:1351–1352.
6. Purcell Jackson G, Tarpley JL. How long does it take to train a surgeon? *BMJ*. 2009;339:b4260.