ORIGINAL REPORTS

Comparison of Canadian and Swiss Surgical Training Curricula: Moving on Toward Competency-Based Surgical Education

Henry Hoffmann, MD, Daniel Oertli, MD,* Robert Mechera,* Salome Dell-Kuster, MD, MSc,*,† Rachel Rosenthal, MD, PhD,* Richard Reznick, MD,‡ and Hugh MacDonald, MD‡*

*Department of General and Visceral Surgery, University Hospital Basel, Basel, Switzerland; †Basel Institute for Clinical Epidemiology and Biostatistics, University Hospital Basel, Basel, Switzerland; and ‡Department of Surgery, Queen's University, Kingston, Ontario, Canada

OBJECTIVE: Quality of surgical training in the era of resident duty-hour restrictions (RDHR) is part of an ongoing debate. Most training elements are provided during surgical service. As exposure to surgical procedures is important but time-consuming, RDHR may affect quality of surgical training. Providing structured training elements may help to compensate for this shortcoming.

DESIGN: This binational anonymous questionnaire-based study evaluates frequency, time, and structure of surgical training programs at 2 typical academic teaching hospitals with different RDHR.

SETTING: Departments of Surgery of University of Basel (Basel, Switzerland) and the Queen's University (Kingston, Ontario, Canada).

PARTICIPANTS: Surgical consultants and residents of the Queen's University Hospital (Kingston, Ontario, Canada) and the University Hospital Basel (Basel, Switzerland) were eligible for this study.

RESULTS: Questionnaire response rate was 37% (105/284). Queen's residents work 80 hours per week, receiving 7 hours of formal training (8.8% of workweek). Basel residents work 60 hours per week, including 1 hour of formal training (1.7% of working time). Queen's faculty and residents rated their program as "structured" or "rather structured" in contrast to Basel faculty and residents who rated their programs as "neutral" in structure or "unstructured." Respondents identified specific structured training elements more frequently at Queen's than in Basel. Two-thirds of residents responded that they seek out additional surgical experiences through voluntary extra work. Basel participants articulated a stronger need for improvement of current surgical training. Although Basel residents and consultants in both institutions fear negative influence of RDHR on the training program, this was not the case in Queen's residents.

CONCLUSIONS: Providing more structured surgical training elements may be advantageous in providing optimal-quality surgical education in an era of work-hour restrictions. (J Surg Ed ▮:▮▮▮-▮▮▮. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: surgical education, resident duty-hour restriction, structured surgical training, surgical skills assessment

COMPETENCIES: Medical Knowledge, Practice-Based Learning and Improvement

INTRODUCTION

Several European countries are facing with an ongoing debate about quality of surgical training in the era of resident duty-hour restrictions (RDHR). In 2005, the Swiss government implemented a 50-hour RDHR per week for all residency programs, responding to the rising concerns of patient safety[1-6] with unrestricted working hours. Likewise, the European Union,[7] the United States of America,[4] and Canada[8] have implemented compulsory RDHR with different limits of maximum allowed working hours.

Apart from patient safety concerns,[1-6] it is still a matter of debate as to whether RDHR have a negative effect on the residents' exposure to surgical procedures and therefore on

Correspondence: Inquiries to Henry Hoffmann, MD, Department of Surgery, University Hospital Basel, Spitalstasse 21, 4031 Basel, Switzerland; e-mail: henry.hoffmann@usb.ch

  1931-7204/$30.00 http://dx.doi.org/10.1016/j.jsurg.2016.07.013

the quality of surgical education.[9-13] Evidence is mixed, and there are bodies of evidence that suggest that RDHR both do, and do not adversely affect surgical training. For example, Moonesinghe et al.[14] reported that the imposed 80-hour RDHR in the United States does not seem to have affected patient safety and has had limited effect on postgraduate training. Additionally, Sadaba and Urso[13] report that alternative working patterns can be deployed to preserve the exposure of residents to surgical procedures. Reports also suggest that diminished training time does not necessarily translate into a decline in surgical competence.[15] Notwithstanding several reassuring reports, there have been numerous opinions and some evidence that RDHR have adversely affected surgical training. For example, Canadian surgical faculty members believe that RDHR restrictions would have a negative effect on both surgical education and preparation for a surgical career.[16] The RDHR in the Unites States has led to a decrease in number of cases performed by trainees,[9,13] compromising exposure to surgical problems.[17] Surgical residents report serious concerns about their procedural competence,[18] resulting in suboptimal experiences.[10,19] There are similar reports from Europe, indicating that up to one-third of surgical trainees are dissatisfied with their training, citing concerns over RDHR and administrative overload.[20] A recent survey among Swiss surgeons revealed that the 50-hour RDHR may have a negative effect on surgical training and the quality of patient care.[21] However, most published reports are of limited quality and show conflicting results, suggesting that firm conclusions cannot be made.[14]

Notwithstanding conflicting data, few would argue that recent changes in the surgical training workplace have been profound. Rooted in an appropriate augmented focus on patient safety, there has been an associated diminution in the degree of independence given to trainees. The rapidly changing development in novel technologies has also resulted in a decrease in trainee experiences. These coupled with RDHR almost worldwide, has posed a serious threat to the integrity of surgical training. It is unlikely that any of these factors would lessen with time. Both Canada and Switzerland are facing with this problem, albeit the Swiss challenge may be greater given the current stricter RDHR. A possible solution to the emerging dilemma may be the transformation of surgical curricula from pure unstructured, time-based, training to highly structured competency-based programs.

Although competency-based education has been defined for some aspects of medical training,[22] there is yet to be significant experience with competency-based education models in surgery. This notwithstanding, surgical education experts have identified the need for highly structured ex vivo training to compensate for the restricted exposure to surgical procedures. This has prompted the development of several initiatives that have used what is ostensibly a competency framework for surgical residency training.[23-31] This framework is a relatively new concept and deploys evidence-based training models coupled with the assessment of residents' competency with validated tools in various domains.[32] The curriculum design aims to achieve competency by a variety of strategies: establishing a modular-based format to improve the flexibility of training; a focus on a rapid ascent to technical competence; diminishing wasted time; and deploying frequent and multimodal assessment.[33] Ferguson et al.[33] have presented early experiences from such a framework, demonstrating that residents exposed to this kind of curriculum may outperform those who have been trained in a traditional time-based, unstructured educational model. Highly structured competency-based programs have been shown to be effective[23,27,33-35] and may indeed reduce the time required to establish competence,[33] underlining their potential importance in addressing concerns of surgical training quality in the era of RDHR.

The general surgical training in Switzerland starts with a 6-year medical undergraduate education based on federal legislation, which is in the end conferred with a medical diploma of the Swiss Confederation.[36] The Swiss Surgical Society (SGC-SSC) governs the postgraduate surgical training, which is typically hospital-based. The registered hospitals are categorized with a predefined maximum length of residency in each category. The training curriculum contains 2 examinations; a basic examination after 2 years of surgical training and the specialist board examination after 6 years. The postgraduate training takes a minimum of 6 years. There are 2 distinct parts: basic training (2 y) and specialist training (4 y). Within these 6 years, there is a minimum requirement of 4 years in general surgery (including 3 mo of anesthesia or intensive care or both). By the end of training, Swiss trainees must present a signed catalog of their operative activities (logbook), prove that for each year they have accumulated 40 Continuing Medical Education points, and take part in 2 annual assemblies of the Swiss Society of Surgery and 4 postgraduate training courses. After gaining board certification, most trainees enter further training in surgical specialties (e.g., upper gastrointestinal and colorectal surgery, vascular surgery, thoracic surgery, and trauma surgery). However, recently a modular-based surgical training curriculum containing emergency, general, abdominal, and trauma modules has been established. Legal implementation is scheduled for 2016 with a transition period of 3 years.

The Canadian surgical training curriculum starts directly after graduating from medical school, which in Canada is 4 years in length, except for 2 Canadian schools that have a 3-year curriculum. All medical schools in Canada are "second entry" with an undergraduate degree usually required as a prerequisite. Surgical training is 5 years in length, with many trainees opting for further subspecialty training in the form of a posttraining fellowship. The system is university-based, with programs administered and