Reflections on Competency-Based Education and Training for Surgical Residents

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INTRODUCTION

Although a number of surgical training institutions have started to adopt competency-based education (CBE) frameworks for training, the debate about the value of this model continues. Some proponents regard CBE as a method of guaranteeing residents competence,[1,2] whereas others consider CBE to be reductive and lacking the richness in experiences that the traditional model offers.[3-5]

In this article, we reflect on CBE and review some salient attempts to implement CBE in surgical education. We identify challenges facing postgraduate surgical education, some of which are motivating educators to consider incorporating CBE into their curricula. We look at some purported advantages and disadvantages of CBE and describe initial reports from CBE programs currently being developed.

CHALLENGES FACING THE EDUCATION OF SURGICAL RESIDENTS

The traditional model of postgraduate surgical education can be referred to as the "time-spent" model.[6] Trainees are expected to spend a minimum period of time in the residency program, working on real clinical cases under supervision, with the assumption that the trainee would be transformed into a competent practitioner over this period.[6,7] Although this training model has existed for over a century,[8] there are no objective data supporting the assumption that the number of years spent in residency is adequate.[1,9] In fact, there is some evidence that the opposite might be true.

One main challenge with the current training paradigm involves ensuring that surgical residents get sufficient exposure to procedures that they would perform in their future careers. Despite the assumption that trainees do perform enough cases to become competent surgeons on graduation, recent studies have shown that surgical residents report significantly less exposure to some surgical procedures than program directors believe might be required.[10] Such findings seriously question whether the level of operative experience in surgical training programs truly ensures trainees' proficiency on completion of residency. One possible reason for the low number of operative experiences is that there are now fewer opportunities for residents to practice in live operations.[11] This is owing to a number of factors, including the recent reduction in resident work hours,[12] concerns about patient safety, and an increased demand for efficiency in operating room time, each of which results in less time for teaching, learning, and practice during surgical procedures.[13]

This reduction in time and opportunity to practice presents a number of serious challenges to residency programs. The work of K. Anders Ericsson and others on the development of expertise has shown that expertise emerges because of continued "deliberate practice" over many years.[14] Deliberate practice involves performing a specific task with attention focused on improving an aspect of the performance, paired with prompt detailed feedback and the opportunity to gradually refine performance through repetitions of the task.[15] Expertise develops as the eventual product of years of this recursive refining process. However, if both time spent on duty and the opportunity to practice in live operations are limited, residency programs would have to find other ways that trainees can get enough "deliberate practice" to become adequately proficient. One option is to extend the length of residency programs, although this is a highly unpopular and, some might say,

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impractical solution.[6,16] Another option is to challenge our traditional training paradigm and consider other options, such as a competency-based training model.

WHAT IS CBE?

Definitions

Some suggest that CBE has its roots in the United States educational reform that took place in the late 1950s to 1970s owing to the growing dissatisfaction with the inadequacy and ill-preparedness of newly graduated teachers.[17-20] It has recently enjoyed a surge in popularity among surgical educators worldwide,[9] owing to the multitude of challenges facing surgical trainees, as mentioned before. Many have viewed CBE as an educational paradigm that can ensure the "competency" of graduating trainees.[21] CBE has also started to be explored at the medical school level.[22,23]

The term "competency" remains a rather vague concept.[24] This is perhaps one reason that there is still a lack of clear consensus about the definition of CBE in medicine. For instance, Ringsted[25] prescribes a 2-dimensional model, designed by Dall'Alba and Sandberg,[26] as it embraces the technical skills (horizontal dimension) as well as nontechnical aspects (vertical dimension) of training. However, while acknowledging the superiority of such holistic approaches, research has focused primarily on sets of particular skills pertaining to the specialty in question. Still, as a whole, CBE is usually defined in its mode of teaching and delivery of education, rather than the specific skills it promotes.

Epstein and Hundert[27] defined professional competence as "the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served." Subsequently, Frank et al.[28] generated the following definition of CBE after analyzing over 173 definitions and extracting common themes from articles on CBE in medicine:

> CBE is an approach to preparing physicians for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from an analysis of societal and patient needs. It deemphasizes time-based training and promises greater accountability, flexibility, and learner centeredness.

In addition to these elements, we found 2 recurring themes from our review of the literature. The first is the common use of functional analysis to determine competencies by taking professionals' roles and breaking them down into their component behaviors.[2,29,30] The second is that part of the construct of CBE which includes an emphasis on assessment with the intention of giving the trainee feedback that provides direction for improvement.[31,7]

Competency Frameworks in Medicine

The 1990s saw the evolution of one of the most influential competency frameworks in medicine: the Canadian Medical Education Directions for Specialists, or "CanMEDS."[32,33] The CanMEDS framework, created by experts in medical education and evaluation, outlined a number of competencies that residency programs should teach and evaluate and that graduating physicians and surgeons should be able to adequately perform.[32,34]

The present iteration of CanMEDS (2005) outlines 7 "Roles," which are domains of competencies in which every specialist should be proficient: medical expert, communicator, collaborator, manager, health advocate, scholar, and professional.[32,35] These roles and their related competencies[35] have been incorporated into various training, examination, certification, and accreditation standards by the Royal College of Physicians and Surgeons of Canada.[36] Furthermore, the CanMEDS roles have been adopted, and subsequently adapted, in other parts of the world including the Netherlands and Australia.[37]

Similar initiatives to the CanMEDS framework have been made around the world. In the United States, the American Accreditation Council for Graduate Medical Education has developed an Outcome Project delineating 6 domains of competency: patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice.[38] These domains have since been incorporated into curricula design and accreditation criteria in the United States.[38] Similar frameworks have been developed in the United Kingdom, including the Intercollegiate Surgical Curriculum Project and the Dundee Outcome Model.[39,40] However, although we have started to establish competency-based assessment frameworks across the globe, training methods are still embedded in the traditional "time-based" approach.

Compared with traditional training models, a competency-based surgical curriculum differs in several crucial ways (see Table 1). In the following sections, we discuss the possible advantages and disadvantages of the CBE model and the implications it has for surgical educators.

Advantages of CBE

In Canada and the United States, there is a call for reform in medical education to assure that on completion of their programs, graduating physicians and surgeons would be capable of meeting a host of societal needs.[6] CBE can give us a degree of confidence in trainees' capabilities, as they would only successfully complete their residency program if they exhibit competency during their period of training.[1,2]