Published in final edited form as:

JAMA Surg. 2017 August 01; 152(8): 715–716. doi:10.1001/jamasurg.2017.0827.

A Framework for the Assessment of Graduate Medical Education

Morgan M. Sellers, MD,

Center for Surgery and Health Economics, Department of Surgery, Hospital of the University of Pennsylvania, Philadelphia.

Bijan A. Niknam, BS,

Center for Outcomes Research, Children's Hospital of Philadelphia, Philadelphia, Pennsylvania.

Rachel R. Kelz, MD, MSCE

Center for Surgery and Health Economics, Department of Surgery, Hospital of the University of Pennsylvania, Philadelphia.

Overview

The recently announced recommendations of the Accreditation Council for Graduate Medical Education (ACGME) on revisions to the Common Program Requirements are the latest accommodation by the medical training system to improve patient safety and quality.¹ This revision, along with the competency-based “milestone project” of the ACGME, represents progress in developing an outcomes-based training system that produces independent practitioners and an environment supportive of the well-being of trainees. We applaud the efforts of the ACGME to create a system that recruits and retains talented trainees, equips them to succeed in an evolving health care environment, and enables them to provide high-quality care.

However, graduate medical education (GME) lacks a data-driven feedback system to evaluate how residency-level competencies translate into successful independent practices. Such a mechanism is crucial to the mission of GME to efficiently produce physicians. Careful consideration of the multiple dimensions that reflect a successful training program must be used to define metrics. To guide the development of a holistic system, we have developed a comprehensive, learner-centered framework using patient and clinician outcomes. Using such a framework will facilitate the coordination of existing efforts to define and measure the quality of the training system and guide future improvements in GME.

Corresponding Author: Rachel Rapaport Kelz, MD, MSCE, Center for Surgery and Health Economics, Department of Surgery, Hospital of the University of Pennsylvania, 3400 Spruce St, Philadelphia, PA 19104 (rachel.kelz@uphs.upenn.edu).

Conflict of Interest Disclosures: None reported.

Publisher's Disclaimer: The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

The Existing Evidence

Historically, surgical training was primarily experiential, consisting of complete immersion in the demands of patient care for countless hours. The implementation of duty hour standards led to a significant reduction in the time allowed for training—in general surgery, it is estimated that restricting hours contracted a residency period by 6 to 12 months.² This radical shift necessitates a strategy to measure its effect on trainees and patients.

Evaluating GME is complicated by the fact that trainees simultaneously learn and provide patient care. Most research in this area has focused on the role of providing, assessing the effect of trainee involvement on patient outcomes during training. If trainees are instead considered learners, the metrics of training success should be measured after they transition to independent practice. The concept of using patient outcomes associated with independently practicing clinicians to measure the success of GME has been proposed and tested in limited areas.^{3–5} To our knowledge, however, little attention has been paid to tracking other types of outcomes for clinicians.

Recognition of the importance of the personal well-being of physicians has expanded significantly since duty hour rules were first introduced. The extent of burnout and depression among trainees and independent clinicians continues to draw attention,⁶ and there is increasing evidence of its association with patient safety.⁷ Consequently, training programs are expected to include “psychological, emotional, and physical well-being” as a competency that must be addressed.¹ How should such a competency be measured beyond the training period? What weight should it be given compared with technical skills or clinical excellence? These are questions that the GME community and the entire profession must consider and answer. Within our research, we have looked to other fields for conceptual models to organize the array of potential metrics that could be used.

Proposed Framework

One such model, the outcome measure hierarchy used by Porter⁸ to define value in health care, consists of a 3-tier framework to identify and rank metrics for the essential components of a complex construct (Figure). By adapting this model to define quality in surgical training, we propose a novel framework to identify potential metrics, conceptualize their relationships, and rank their relative importance. The model is innovative because it connects training processes to patient outcomes, considers the learner’s success or failure in the context of the system, and connects the continuum of GME and continuing medical education rather than isolating each.

Tier1 includes standard outcome measures of training programs, such as board certification and satisfactory patient results. Once these critical metrics are examined, the evaluation of the system can proceed to metrics affected by the training process (tier 2). These include direct measures of the physical and mental health effects of training and the opportunity costs (financial and otherwise) incurred by trainees. Selecting these measures should be informed by tier3, which tracks what we have termed the *sustainability of training*(ranked last because of its temporal relationship with tiers 1 and 2). This framework will help to

guide the selection of balanced and comprehensive metrics to evaluate GME, prioritizing patient outcomes while incorporating the personal effects of training and practice on physicians in a systematic fashion.

Neither designing nor implementing such a system will be easy. While some metrics (eg, certifications, practice arrangements, and years in practice) are simple and already captured, others (such as physical and mental health) are complex and not currently tracked. These will require a system that carefully protects the privacy of individual practitioners. Identifying the appropriate timespan targeted for each group of metrics is another challenge. The influence of a specific training program on a surgeon's patient outcomes appears to fade within 5 to 10 years.⁴ Logically, the same would be true for the influence of training on other outcomes. Some of these measures, particularly in tier 3, are perhaps best suited to evaluate continuing medical education rather than GME (Figure). Finally, we believe that the proper scope for this framework is the collective performance of the entire training system as promulgated by the ACGME. In time, variations at the program level may become more important.

Conclusions

Any miscalculation in the process of altering and refining GME could negatively affect patient care for decades. We strongly believe that the future of high-quality medical and surgical care lies in using data to make timely assessments of the training system and guide further refinements being made to it. Using a comprehensive framework such as our proposed one will allow us to appropriately select which data are used to secure a proficient clinician workforce in the future while providing high-quality care to patients today.

Funding/Support:

The research reported in this publication was supported by award R01AG049757 from the National Institute on Aging of the National Institutes of Health.

Role of the Funder/Sponsor: The funding organization had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

REFERENCES

1. Accreditation Council for Graduate Medical Education. ACMGE common program requirements section VI proposed major revisions. http://www.acgme.org/Portals/0/PFAssets/ReviewandComment/CPR_SectionVI_ChangesTracked.pdf. Accessed November 8, 2016.
2. Lewis FR, Klingensmith ME. Issues in general surgery residency training—2012. *Ann Surg*. 2012; 256(4):553–559. [PubMed: 22964740]
3. Asch DA, Nicholson S, Srinivas S, Herrin J, Epstein AJ. Evaluating obstetrical residency programs using patient outcomes. *JAMA*. 2009; 302(12):1277–1283. [PubMed: 19773562]
4. Bansal N, Simmons KD, Epstein AJ, Morris JB, Kelz RR. Using patient outcomes to evaluate general surgery residency program performance. *JAMA Surg*. 2016;151(2):111–119. [PubMed: 26510131]
5. Tarpley JL, Smalley WE Jr. Making a difference in surgery residency programs. *JAMA Surg*. 2016;151 (2):119. [PubMed: 26509411]
6. Elmore LC, Jeffe DB, Jin L, Awad MM, Turnbull IR. National survey of burnout among US general surgery residents. *J Am Coll Surg*. 2016;223(3):440–451. [PubMed: 27238875]

7. Balch CM, Freischlag JA, Shanafelt TD. Stress and burnout among surgeons: understanding and managing the syndrome and avoiding the adverse consequences. *Arch Surg.* 2009;144(4):371–376. [PubMed: 19380652]
8. Porter ME. What is value in health care? *N Engl J Med.* 2010;363(26):2477–2481. [PubMed: 21142528]

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Figure.**The Outcome Measures Hierarchy for Medical Training Systems**

Tier 1 consists of outcomes measuring the achievement of successful training as preparation for the mastery of surgical care. Tiers 2 and 3 include measures less directly tied to patient outcomes but increasingly recognized as crucial to successful independent practice as well as the overall success of the educational system.