GUT INSTINCTS: MY PERSPECTIVE

Teaching Old Dogma with New Tricks and Technology: Educational Paradigm Shifts in Graduate Medical Education

Suzanne Rose, MD, MSEd

Clinical and Translational Gastroenterology (2015) 6, e78; doi:10.1038/ctg.2015.4; published online 19 March 2015

INTRODUCTION

Huge changes are occurring in medical education across the continuum of physician training. Advanced understandings of adult learning theory, an explosion of scientific information, and new tools and technology both in medicine and in education are driving these transitions. Furthermore, a transforming culture of medical practice represented by increased patient autonomy, health-professional teamwork, and advances in health-care reform are effecting change. In addition, we must acknowledge the shifting generational values of those entering our educational programs and support their articulated values that continue to promote service but also stress work-life balance. There is a striking difference in values between the baby boomers, who are teaching and supervising Gen Y (also known as Millennials), our students and trainees. Each generation can be defined by certain general characteristics (Table 1). Appreciating these differences and supporting each other’s values are key to a favorable learning climate.

Changes in education are seen across all aspects of medical education. Current medical students are voting with their feet, not showing up for lectures, and demanding technology-assisted educational tools. Although promoting more active learning, in concert with adult learning theory, the undergraduate medical curriculum has flipped the classroom, incorporated team-based learning, and is fostering interprofessional education. Continuing Medical Education (CME) has also undergone a remarkable transformation, branching out from the more traditional (and previously predominantly pharma-supported) large audience programs to a menu of choices including web-based learning and point-of-care options. Maintenance of certification is currently the source of much controversy, but a positive focus for continuing medical education is quality- and value-based clinical care.

Perhaps the transformations in graduate medical education (GME) reflect the greatest degree of change, which have been implemented in a fairly rapid fashion, largely dictated by accrediting agencies. GME has been in the forefront of educational principles in medical education, having established the six areas of core competencies developed as part of the Outcome Project that began in 1998. These include patient care, medical knowledge, practice-based learning and improvement, systems-based practice, professionalism, and interpersonal skills and communication. The concept of competency is one that befits the training of future physicians, requiring excellence and setting the bar high for this responsible and privileged role. This notion is also consistent with the transforming generational values, with younger generations valuing competency in contrast to the boomers who appreciate experience over expertise. Competency sets the threshold for the knowledge and skills necessary to safely and proficiently perform a task. It is not defined by time immersed in learning or by numbers (e.g., of procedures), but rather by the demonstration of expertise.

The Accreditation Council for Graduate Medical Education (ACGME) has implemented the Next Accreditation System (NAS) with several components (Table 2) and many new educational terms reflecting the key features of the NAS (Table 3).

Milestones are a prominent feature of the NAS and are intended to develop highly competent practitioners to provide state of the art care with accountability to the public. Similar to the milestone markers that denote distances on a highway, educational milestones represent significant points in development and identify progressive outcomes as trainees advance in capability. Reporting milestones have been developed for internal medicine and the internal medicine sub-specialties with a requirement to assess fellows biannually. Milestones are intended to provide transparent expectations for the trainee and the program director; they also foster self-directed learning, promote development of assessments linked to exactly what needs to be evaluated, and provide a framework for feedback.

There are two additional features within this educational paradigm: curricular milestones and entrustable professional activities (EPAs), neither of which are current requirements of the NAS. Curricular milestones represent specific objectives that are, by definition, granular and can be used to direct curriculum development and assessments. EPAs are defined tasks or responsibilities associated with a professional role that an individual is trusted to perform independently and without supervision, once competence has been achieved.
Gut Instincts: My Perspective

Table 1 Characteristics of the generations

| Component                  | Traditionalist        | Baby boomer        | Gen X               | Gen Y or Millennial |
|----------------------------|-----------------------|--------------------|---------------------|---------------------|
| Year of birth              | 1925–1945             | 1946–1964          | 1965–1980           | 1981–2000           |
| Notable events             | WW II                 | Space exploration, | Vietnam War, Watergate, rise/fall | Persian Gulf War, Internet, multiculturalism |
| Attributes                 | Veterans, loyal, follow rules | Driven, question authority, optimistic | Latch-key kids, independent | Structured, team player |
| Work is                    | An obligation         | An adventure       | Difficult and challenging | A means to an end |
| Leaders/teachers           | Respect them          | Replace, challenge them | Ignore them | Leaders and teachers must respect us |
| Other                      | Do the right thing    | Workaholics        | Do not believe in “paying your dues” | Happy without having it all |
|                            | Clear gender roles    | Value experience over expertise | Work success defined by competence | Hardworking, but desire balance |

Gen, generation; WW II, World War II.

Variations of the year intervals appear in the literature.

Table 2 Components of the NAS

| Component                  | Description                                                                 |
|----------------------------|-----------------------------------------------------------------------------|
| Data collection            | ADS                                                                         |
|                            | • Statistics                                                                |
|                            | • Structure and resources of the program                                    |
|                            | • Scholarly activity                                                        |
|                            | • Teaching responsibilities                                                 |
|                            | Board pass rates                                                            |
|                            | Clinical experience                                                         |
|                            | Trainee survey                                                              |
|                            | Patient safety                                                              |
|                            | Faculty survey                                                              |
| Semiannual milestone data  | Program directors must complete the required reporting milestone document for each fellow |
| 10-year program self-study | Self-study will lead to a site visit                                        |
| CLER visit                 | Not linked to accreditation                                                 |
|                            | Institutionally based and not tied to a specific program                    |
|                            | Focus on six areas:                                                        |
|                            | • Patient safety programs                                                   |
|                            | • QI initiatives                                                            |
|                            | • Transitions in care                                                       |
|                            | • Supervision                                                               |
|                            | • Fatigue mitigation/duty hours                                              |
|                            | • Professionalism                                                           |

ADS, Accreditation Data System; CLER, clinical learning environment review; NAS, Next Accreditation System; QI, quality improvement.

EPAs for Gastroenterology Fellowship Training were developed through a multi-society effort (Table 4). These EPAs delineate the tasks that define the profession of gastroenterology and hepatology, and incorporate the work of the previously published core curriculum. A detailed toolbox accompanies this project along with additional educational supportive materials, for each EPA including specific objectives, links to ACGME competencies, suggestions for assessments, and a description of the implication of entrustment. Assessment is a key component in competency-based education; perhaps the greatest challenge for gastroenterology program directors is to identify the best evaluation tools for the reporting milestone requirement. This is an area for continued development for gastroenterology educators.

Why all of these changes? Did not the boomers turn out just fine? Let us consider this in an open-minded context. Just a couple of questions can demonstrate the examples of the rapidly changing landscape of science and practice: (1) Where is the endoscopic teaching attachment? It is hard to believe that the first videoendoscopes were introduced in the early 1990s. Current fellows and anyone completing fellowship in the past 15 years have probably never seen a teaching attachment; and (2) Are you kidding, a bacteria causes ulcers? Helicobacter pylori is a noted paradigm shift discovery from the 1980s. Many of us began our training in medicine without thinking of this relationship, and as the correlation evolved, we were incredulous at first. Such innovations and discoveries were made not that long ago and many who trained before these changes are still engaged in the practice of gastroenterology. As we expect a future of continuing rapid advances, our focus must evolve to the key competencies of information retrieval skills and lifelong learning strategies. The ability to recognize what one knows and to acknowledge one's own knowledge gap with the know-how to address that gap becomes the essential competency.

We are also dealing with an aging patient population and aging physicians in practice. These demographic truths, along with altered expectations from patients (boosted by television, movies, the media, lifestyles, and technology), require new approaches. We expect to see technology applied to greater degrees in medicine with smartphones and other perhaps yet-to-be-developed technologies advancing the communication between practitioner and patient and between interprofessional colleagues.

We are not entirely ready for these changes. How are we shifting old educational paradigms to account for these changing accreditation requirements and the advancing capabilities in gastroenterology and in medicine related to technology?

Perhaps we should examine the prerequisites for training. Is it really necessary to have 14 years after high school to train a gastroenterologist? Who are the teachers? How do we assess...
our trainees to be sure they are ready? How do we evaluate them after training to be sure their skills are up to par for their practice? As we examine these issues, we also need to consider whether there should be alternative training for cognitive vs procedure-based roles; we need to define the team leader (is it going to be the MD?) as our current trainees will be practicing in a team-based environment and provide skill training to our fellows for leadership training. And finally, we need to seriously address whether it is necessary to train everyone in all of the sub-specialties in gastroenterology and hepatology, such as motility, hepatology, pancreatobiliary, and nutrition, and if so, to what degree.

The art and science of medicine are transforming. Our trainees need to prepare not only for the practice of gastroenterology tomorrow but also for practice in 30—or more—years. The challenge for us—is across the spectrum of ages, training, experience, expertise, and practice type—is to first of all, embrace change. We need to prepare for change, answer the above pending questions by thinking outside the box and—just as we did with H. pylori—we need to be courageous in discarding old dogma in efforts to accept new paradigms.

**CONFLICT OF INTEREST**

**Guarantor of the article:** Suzanne Rose, MD, MSEd.  
**Specific author contributions:** Suzanne Rose.  
**Financial support:** None.  
**Potential competing interests:** Dr Rose serves as the Education Councillor on the AGA Governing Board and recently served as a member of the AAMC’s Task Force on Evaluating Educators.
Disclaimer

The opinions expressed in this piece are solely those of the author and do not represent those of any organization or society.

1. Busari JO. The discourse of generational segmentation and the implications for postgraduate medical education. *Perspect Med Educ* 2013; 2: 340–348.
2. Mehta NB, Hull AL, Young JB et al. Just imagine: new paradigms for medical education. *Acad Med* 2013; 88: 1418–1420.
3. Tersteeg PS. Boarded to death—why maintenance of certification is bad for doctors and patients. *N Engl J Med* 2015; 372: 106–108.
4. Swing SR. The ACGME outcome project: retrospective and prospective. *Med Teach* 2007; 29: 648–654.
5. Ten Cate O, Scheele F. Competency-based postgraduate training: can we bridge the gap between theory and clinical practice? *Acad Med* 2007; 82: 542–547.
6. Nasca TJ, Philibert I, Brigham T et al. The next GME accreditation system—rationale and benefits. *N Engl J Med* 2012; 366: 1501–1506.
7. The Accreditation Council for Graduate Medical Education and the American Board of Internal Medicine. The Internal Medicine Milestone Project http://www.acgme.org/acgmeweb/Portals/0/PDFs/Milestones/InternalMedicineMilestones.pdf. Accessed 12 January 2015.
8. The Accreditation Council for Graduate Medical Education and the American Board of Internal Medicine. The Internal Medicine Subspecialty Milestones Project http://www.acgme.org/acgmeweb/Portals/0/PDFs/Milestones/InternalMedicineSubspecialtyMilestones.pdf. Accessed 12 January 2015.
9. Ten Cate O. Nuts and bolts of entrustable professional activities. *J Grad Med Educ* 2013; 5: 157–168.
10. Rose S, Fix O, Shah BJ, Jones TN, Szyjkowski RD. Entrustable professional activities for gastroenterology fellowship training. *Gastroenterology* 2014; 147: 233–242. Published in multiple journals simultaneously as an effort of the five GI societies. *Hepatology* 2014;60(1):433–43; *Gastrointest Endosc* 2014;80(1):16–27; http://onlinelibrary.wiley.com/doi/10.1111/hje.12382/full; http://gi.org/wp-content/uploads/2014/06/EPA_for_Gastroenterology_Fellowship_Training.pdf.

The Editors encourage readers with comments and opinions regarding the Gut Instincts: My Perspective series to submit a letter to the editor expressing their views to mc.manuscriptcentral.com/ctg.

Clinical and Translational Gastroenterology is an open-access journal published by *Nature Publishing Group*. This work is licensed under a *Creative Commons Attribution-NonCommercial-ShareAlike 4.0* International License. The images or other third party material in this article are included in the article’s Creative Commons license, unless indicated otherwise in the credit line; if the material is not included under the Creative Commons license, users will need to obtain permission from the license holder to reproduce the material. To view a copy of this license, visit [http://creativecommons.org/licenses/by-nc-sa/4.0/](http://creativecommons.org/licenses/by-nc-sa/4.0/).