

A Mile Wide but 1 Cell Thick: The Need to Prioritize Learning in Graduate Medical Education

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In our culture, many things are advertised as or assumed to be limitless: things to buy and credit for purchasing; after school activities for children; residency applications; and meaningful use requirements. Yet as a geriatrician I cannot avoid seeing the hard stop: life and health are not limitless. Nor is time to teach and learn within graduate medical education. As new requirements expand despite constricted resident time, some areas must give: not everything labeled as a *must learn* can be achieved to a level of true independence for every trainee. As a result, there is an urgent need for graduate medical education leaders to thoughtfully prioritize learning experiences. This will require consideration of the processes of learning, how trainees interact with role models and patients, and the explosion of requirements from diverse sources.

Learning Cannot Be Rushed

We know that integrating information and *deep learning* are complicated, time-consuming processes.¹ Developing expertise—and don't we all want care from a physician with expertise, rather than one deemed just adequate?—takes even more time, with the amount of time somewhat proportionate to the amount of material being learned.² The famous study by Simon and Chase³ demonstrated that world-class chess masters could meaningfully use approximately 50 000 chess patterns. This required substantial time (from 50 000 to 100 000 hours of practice) to learn to apply this pattern recognition.^{1,3} Other studies support that at least a decade of practice is needed to achieve expert performance in many fields.²

Deep learning involves being cognitively engaged in the exploration, integration, and testing of concepts and solutions; it also requires a high level of critical thinking. This is in contrast to *surface learning*, in which little effort is employed to achieve the minimum required outcomes. Surface learners are motivated to complete the task rather than truly understand the topic.⁴ For many, if not most faculty and residents, surface learning is the default approach to the escalating number of required sessions that are

generic, repeated each year, and do not align with interests or career plans. This approach may produce critical learning deficits. The rapid click forward technique, to advance through large numbers of required PowerPoint slides or talking head videos, becomes a survival tactic.

If residents are overloaded with assignments, what will they do? Residents will do what everyone does: focus on the most apparently urgent tasks—urgent, but not necessarily the most important. Tasks imposed that are without immediate relevance may receive a cursory pass in order to hoard scarce time. Usually residents have less discretionary time and time management skills than faculty. Program directors may not expect residents to engage in deep learning on all sessions required by an institution. This places prioritization in the hands of trainees, rather than the program.

Learning Requires Meaningful Interaction

Although interaction is often assumed to be both necessary and sufficient for deep learning, research demonstrates that this is not the case.⁴ Deep learning requires critical analysis of ideas and repeated reflection, with ongoing practice and application to new and increasingly ambiguous examples.⁴ Thus, ensuring that an online module or small group session has interactive aspects, such as an unfolding case, or questions with hypertext-linked explanations, does not guarantee deep learning; neither does establishing linkages among learners through social media. Furthermore, having other individuals in the room does not guarantee meaningful interactions.⁴ Facilitating interactions requires attention to the quality and types of exchanges among residents, educators, and ideas.

Examples of probable surface learning abound in the literature. A 2010 article described the incorporation of required topics into the standard education conference time by substituting 10 hours per year over 2 years, or 20 hours of the full curriculum (BOX).⁵ This approach may allow each topic to be checked off a list, but it is unlikely to produce deep or sustained learning. However, when faced with multiple directives and limited resident duty hours, program

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directors may compromise between requirements and reality.

Decreased Time With Patients and Attendings

Despite evidence that learning requires meaningful interaction, hospital-based studies show decreased continuity of attending-resident, resident-student, and attending-student interactions. This results in reduced time for role modeling, mentoring, and personal relationships, as well as decreased satisfaction with faculty teaching.^{6,7}

In 1 report, orthopedic residents used 31% of their time for documentation/administration and 23% for patient care.⁸ Internal medicine interns spend even less time with patients and attendings. In a Veterans Affairs hospital time-motion study of interns, researchers reported 40% of time was spent in clinical computer work, 30% in nonpatient communications, 12% with patients, and 11% in teaching/learning activities.⁹ This equated to less than 2 hours a day with patients and 90 minutes on other education, such as attending discussions. Another time-motion study found medical interns spent 12% of time with patients, 15% in educational activities, and 40% in computer use.¹⁰ These findings are consistent with other reports of patient care versus documentation in the current era,^{11–14} which is in contrast to earlier studies showing more time spent in patient care.¹⁵

In line with evidence that deep learning requires meaningful interactions, residents report that they learn best from attendings and from clinical work, which drives their reading.^{16,17} Residents also perceive that documentation requirements have deleterious effects on their learning and on patient care.^{18,19} The electronic health record (EHR) has squeezed resident time even further.^{14,20,21}

Resident perceptions may not be the best method to determine optimal learning methods, but their perceptions are reality when assessing satisfaction with training and later practice. Collegial relations with attendings were a key factor in resident satisfaction in a national survey of 248 surgical residencies.²² Decreased time and continuity with attendings are not likely to promote collegial relationships. An early study of primary care residents (pediatrics, family medicine, and internal medicine) found that collegiality was a key factor in job satisfaction; the authors' model explained 65% of the variation in resident satisfaction and included continuity of care, autonomy, collegiality, work encouraging professional growth, and work group loyalty.²³ All of these may be constrained by increased time on superficial learning and EHR documentation.

Box Topics at Risk for Surface Learning Approaches^a

- Structure and policy of US health care
- Advocacy
- Medical economics and finance
- History and consequences of major legislation
- Innovation in health care
- Health care technology
- Comparative effectiveness
- Health care disparities
- Basic management principles
- Quality, performance improvement
- Patient safety
- Coding and billing compliance
- Legal issues
- Litigation
- Risk management
- Clinical practice models
- Contracts
- Relative value units
- Personal leadership styles
- Organization psychology
- Negotiation and conflict resolution
- Communication
- Ethical issues
- Six Sigma

^a Adapted from Tapia et al.⁵

Proliferation of Topics

In 2008, a joint Accreditation Council for Graduate Medical Education and American Board of Internal Medicine task force created developmental milestones for internal medicine residents. With the goal of all residents achieving the *competent* level, the task force produced 142 milestones.²⁴ By 2014, all specialties and subspecialties had specialty-specific reporting milestones in place for semiannual resident ratings. In turn, the milestones have led to expanded resident assessments.

Family medicine, a 3-year program, has 21 milestones and 39 subcompetencies at the graduate target, level 4 (readiness for unsupervised practice) and 326 subcompetencies across the 5 levels.²⁵ Obstetrics and gynecology has 26 milestones and 93 subcompetencies at level 4, which also includes an additional 19 procedures as sub-subcompetencies.²⁶ Geriatrics, a 1-year fellowship, has 23 milestones and 79 subcompetencies for assessment at level 4.²⁷ Other specialties have a similar or even greater number of

TABLE

Sample Resident Time Grid

Minutes at Work	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Time with patients							
Clinical time with attendings, team, handovers							
Live educational conferences							
Reading about patients							
Socializing with attendings, team, residents (eg, meals)							
Required online modules							
EHR documentation							
Other administration work/documentation							
Travel time							
Sleeping							
Total hours ≤ 80							

Abbreviation: EHR, electronic health record.

milestones.²⁸ Although critically needed, milestones and assessments also may compete with patients and role models for resident time.

In addition, the 6 Clinical Learning Environment Review (CLER) focus areas include training expectations, with more potential check boxes. While CLER and milestones are vital and momentous steps toward standardizing residency education, they coincide with new meaningful use EHR documentation, the requirements of the Health Insurance Portability and Accountability Act and other essential topics, and expanding institutional priorities, such as risk management. In other words, residents have more on their plates than they can swallow—or digest. Surface learning strategies inevitably come into play. For residents, critical competencies may become lost in the forest of topics. Program directors and educators must step forward and determine the most critical areas in order to ensure that deep learning occurs. Not everything can be an equal priority in a time-constrained framework.

What to Do?

Time management strategies stress the need to differentiate “urgent/not important” and “urgent/important” from “nonurgent/important,” lest we defer the latter indefinitely.²⁹ Programs may choose to explicitly analyze resident time through time-motion studies that could also serve as scholarly research or quality improvement projects (TABLE). New technologies, such as smartphones, could facilitate these measurements. Programs will need to evaluate resident activities to identify those of lower priority for a particular specialty, program, or resident.

As always, this will require differentiating hospital and institutional priorities from educational priorities.

Specialties may also wish to reassess which milestone subcompetencies are essential for graduation. Foremost, programs need to balance resident time with patients and educators versus time spent with the EHR and in generic online or live sessions. This will involve an honest, fearless examination of the number of faculty available for teaching versus the number of residents, and the educational value of each required rotation, experience, conference, and assignment. Doubtless this work is well underway: we invite your responses in the form of research papers, reviews, or letters.

Do we want graduates who employ surface learning or deep learning? I know which one I prefer.

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