Creating a Learning Environment to Produce Competent Residents: The Roles of Culture and Context

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ABSTRACT

Six core competencies have been developed for use by residency programs in assessing individual resident training outcomes. The authors propose that it is important to consider the role of residency culture and work context in helping residents achieve the required competencies. Specifically, the development of a learning-oriented culture and favorable work conditions that facilitate the presence of that culture should be a high priority for residency programs and the organizations (e.g., hospitals) in which they are housed. This places formal accountability at the doorstep of these programs and organizations in helping to create a "competent" resident. Using ideas from management theory, the authors identify specific attitudes, behaviors, and interactions that define a learning culture and show their usefulness when applied to residents' achievement of the competencies. They assert that current features of everyday resident work life decrease the chances that such attitudes, behaviors, and interactions will occur. Identifying and prioritizing the components of desired work environments for promoting a learning-oriented culture, in addition to assessing the presence or absence of both the components and learning best practices within residency programs, should become normal activities that complement the process of assessing competencies.

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The move towards developing core competencies, which can help in assessing whether or not a resident in training is ready to be a practicing physician, is a significant development in U.S. medical training. These competencies, filtered into six general areas of expertise (see Table 1), have been developed through an inclusive process involving residency programs and physicians across the country.[1] The development of these six competencies is perhaps only the beginning of a prolonged attempt to align medical training in the United States more closely with the contemporary health care environment in which physicians now find themselves. "The 'substance' of medicine is enduring," as David Leach, executive director of the Accreditation Council for Graduate Medical Education (ACGME), states, but it is the forms through which that substance is conveyed which require change over time.[2] It is within this spirit that the competencies movement has begun. It should also be within this spirit that additional concerns are raised regarding how to modify other aspects of U.S. medical training, to further enhance transmission of that substance which creates trained physicians.

In this article we identify the need to turn collective attention to the culture and context surrounding residency training in health care institutions such as hospitals. We maintain that the establishment of a supportive, learning-oriented culture is of utmost importance in creating competent physicians.[2–4] We also believe that the dynamics of the surrounding organizational work context shape the establishment and maintenance of such a culture, and that many of these dynamics play out at present in ways that undermine

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Table 1

Core Competency Areas for Residency Training Approved by the ACGME*

Competency Area	Select Elements of Competency Area
Patient care	Provide care that is compassionate, appropriate, and effective Communicate effectively and demonstrate caring, respectful behaviors Perform competently all medical and invasive procedures considered essential for area of practice
Medical knowledge	Demonstrate an investigatory, analytical thinking approach to clinical situations Know and apply the basic and clinically supportive sciences appropriate to the discipline
Practice-based learning and improvement	Analyze practice experience and perform practice-based improvement activities using a systematic methodology Facilitate the learning of students and other health professionals
Interpersonal and communication skills	Engage in effective information exchange and teaming with patients, their families, and professional associates Work effectively with others as a member or leader of a health care team
Professionalism	Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population Show respect, compassion, and integrity, and be responsive to the needs of patients and society in a way that supercedes self-interest Demonstrate a commitment to excellence and ongoing professional development
Systems-based practice	Demonstrate an awareness of and responsiveness to the larger context and system of health care Use the resources of the system effectively to provide care of optimal value

*From the Web site of the Accreditation Council for Graduate Medical Education, <www.ACGME.org>.

the ability of residents to excel in the six ACGME general competencies. The cultures and everyday work contexts of residency programs are important factors that inevitably will contribute to some level of variation in the acquisition of competencies across residents and residency programs. How we come to think about and do our jobs is shaped by the established norms, values, and circumstances in which our learning takes place.[5] Sustained learning occurs only within contexts that provide supportive conditions.[4] Residency programs must provide an environment in which early career physicians learn how to do their jobs right. The sites in which they train should be expected to support that aim.

Thus, in addition to measuring the six competencies, the cultural and contextual aspects of residency training should be identified, prioritized, and measured on a regular basis to gain an accurate picture of how and why some residents (and residency programs) achieve higher performance than others in the various competencies. Residency programs and the organizations in which they are housed (e.g., hospitals) must become more accountable for providing the necessary supportive climate and work conditions for the individuals they train. If the initial phase of the competencies movement has produced a heightened expectation that individual residents demonstrate specific, measurable skills, the next phase should examine how they will be provided with the type of learning atmospheres in which they can have a fair shot at developing these skills. With this goal in mind, Figure 1 provides a visual representation of the interrelated nature of work context, culture, and the individual residents' achievement of competencies that we lay out in more detail in the rest of this article.

NEED FOR A LEARNING CULTURE TO FOSTER RESIDENTS' COMPETENCE

During the 1980s and early 1990s, many U.S. companies across a variety of industries faced concerns similar to those now faced by the profession of medicine, i.e., the need to more clearly demonstrate the quality of goods they provided, the need to meet shifting service demands of customers, and the need to incorporate rapidly changing technologies in their work. Established companies such as IBM, General Electric, and Xerox found themselves pressed to reexamine how they traditionally did business. Young companies such as Southwest Airlines and Microsoft wedded themselves to new assumptions regarding consumer satisfaction and production.

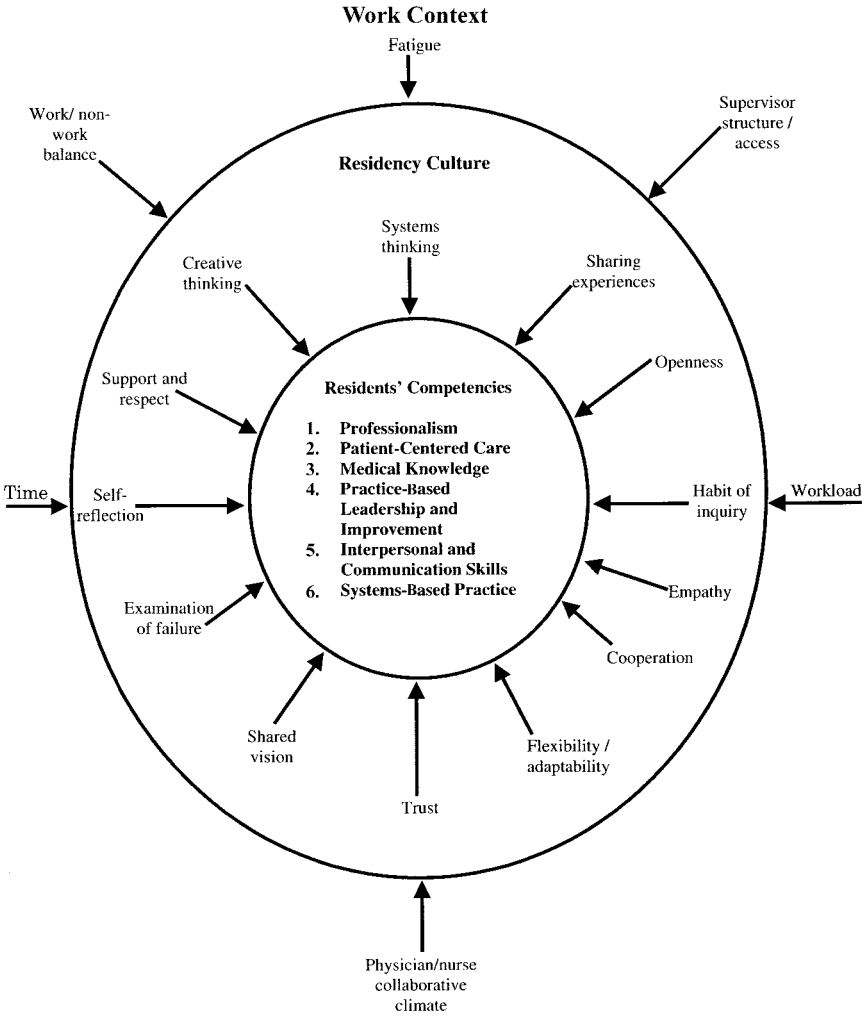

Figure 1. The interwoven nature of work context, culture, and residents' achievement of the ACGME competencies. The residency culture should be identified, prioritized, and assessed concerning how well it promotes residents' acquisition of those competencies. Elements of a learning-focused culture like those identified should be promoted within residency settings. In addition, key elements of the surrounding work context that influence whether or not those elements can occur should also be identified and measured, with the residency program and institution held accountable for their presence or absence.

In particular, key objectives involved how to train employees to do their jobs better and become innovative in their work.

It was at this time that the concept of the "learning organization" took off in corporate North America. The term ignited a revolution in how managers and employees within these companies thought about and acted within their work environments. Led ideologically by individuals such as Peter Senge, an organizational researcher at MIT, the learning organization came to be known as one which possesses an increased capacity for qualities such as information sharing, worker participation and innovation, experimentation, using failure events to improve core work processes, constant self-examination of decision making, and commitment to change.[6–8]

The learning organization concept is applicable to the current residency training environment. First, it is consistent with the drive to produce a competencies-focused work experience for residents. The implicit management philosophy underlying learning organizations focuses on key ingredients to long-term success in fast-moving, unpredictable environments like health care. These key ingredients also characterize the competencies movement and include the ability to collect and evaluate new data and adapt organizational performance based upon new information. In the learning organization, worker performance is integral to organizational performance. This is part of what having measurable competencies is all about, i.e., defining and monitoring clear-cut performance and training goals among residents

Table 2

Characteristics of a Learning Organization and Associated Best Practices*

Characteristic	Definition	Associated Attitudes, Behaviors, and Interactions (i.e., Best Practices)	Core Competencies That Are Most Effectively Fostered by the Learning Characteristic
Self mastery—individual	The ability to honestly and openly see reality as it exists; to clarify one's personal vision	Positive reinforcement from role models/ managers Sharing experiences Frequent interaction between supervisory levels Emphasis on feedback Self-reflection	Interpersonal and communication skills Professionalism Patient care
Shared mental models—individual	The ability to compare reality with perceptions of that reality; reconciling both into a coherent understanding	Self-reflection Habit of inquiry Forgiveness of oneself Flexibility/adaptability in approaching work	Practice-based learning and improvement
Shared vision—group	The ability of a group of individuals to hold a shared picture of a mutually desirable future	Group reflection Trust Empathy towards others Habit of information dissemination Emphasis on cooperation	Patient care Systems-based practice
Team learning—group	The ability of a group of individuals to suspend personal assumptions about each other and engage in "dialogue" rather than "discussion"	Group reflection Consensus building Top-down and bottom-up communication flows Support over blame Creative thinking Examination of failure	Medical knowledge Interpersonal and communication skills
Systems thinking—group	The ability to see interrelationships rather than linear cause—effect; the ability to think in context and appreciate the consequences of actions on other parts of the system	Practicing self mastery Possessing consistent mental models Possessing a shared vision Emphasis on team learning Views immediate realities within larger organizational and environmental contexts	Systems-based practice Patient care

*Adapted from the work of Senge,[4] Argyris,[7] and Schon[37]; full citations are in the reference list of this article.

to create a more adaptable physician workforce and responsive professional training function, in addition to better patient care over the long term. Second, the core attributes of a learning-oriented work environment increase the chances of better performance in each of the six competencies. These core attributes are shown in Table 2 and include self-mastery, shared mental models, shared vision, team learning, and systems thinking.

Underlying each of these attributes, or "disciplines" as the management literature refers to them, are specific "best practices." These best practices are nothing more than ways of thinking, acting, and interacting (see Table 2). They represent a bridge between the five disciplines and how to realize them in everyday practice. As these practices become routine within a given work setting, they become part of the everyday culture. Since they help achieve the learning disciplines, the attitudes and behaviors listed in Table 2 will help to create the kind of culture in which residents can excel at meeting core competencies requirements.

For example, the competency "practice-based learning and improvement" depends upon individuals' moving away from their own perceptions or beliefs about "how things work"

towards a mutually agreed upon, validated reality about the everyday clinical world (i.e., a shared mental model). Residents cannot learn about or improve their practice if they or their trainers carry false or unproven assumptions about how that practice is conducted. Developing a shared mental model within the clinical team around resident training and patient care would facilitate a participative approach to continuous quality improvement on a clinical level. This is in contrast to the too-frequent current approach, which tends to be dictated solely by those higher up in the training hierarchy. With a participative approach, best practices that should be present in residency involve creative tension (where disagreement and dialogue is tolerated up and down the training hierarchy), self- and group reflection (where taken-for-granted assumptions and episodes of failure are critiqued regularly by the clinical team), and inquiry (where questions are asked about not only "how" but "why" patient care and training is conceptualized in a certain way; see Table 2).

Similarly, to become the kind of clinicians excelling in the competency of "interpersonal and communication skills," residents need to be in a culture where everyone has achieved a certain level of satisfaction with both the personal and professional aspects of their lives, and as a result able to see the world and the way one wants the world to be in a more objective manner (i.e., self-mastery). High degrees of individual self-mastery allow members of a group to interact freely and honestly, take risks in interpersonal communication, and accept prima facie that there is always improvement that can be made in one's approach to dealing with others. To move towards achieving this, residents need to be immersed in a culture where interaction between members of the training hierarchy is constant, where the emphasis is on support rather than blame, where intraprofessional relations are respectful, where nonwork interests are encouraged, and where personal and professional experiences are shared by more senior members. These practices lead to enhanced feelings of trust and cohesion that further residents' self-confidence and, in turn, residents' willingness to engage in open, timely information exchange with attending physicians and patients. Not having these practices present in the culture promotes silence, detachment, cynicism, anger, and fear—ingredients that do not sharpen or enhance residents' skills in dealing with people.

The core competency "systems-based practice" depends upon systems-based thinking (Table 2). Attending and resident physicians should embrace a more complex view of medical practice (in which they are not always in complete control) and commit themselves to being leaders in improving upon the negative fallout from that complexity, whether it involves medical errors, decreased patient satisfaction, or decreased quality of care. Systems-based thinking is the Holy Grail of any learning organization.[4]

One of the elements critical to systems-based practice is the development of a shared vision. To develop shared vision, a residency culture must encourage individual and group reflection about work performance, empathy towards others' experiences and the lessons learned from those experiences, cooperation rather than competition, and emphasis on getting individuals to believe in a desired future around better patient care. Systems thinking is cultivated by making residents feel that it is appropriate to ask questions about why certain things are done in the everyday work environment, even if those things fall outside the normal purview of physicians or are viewed by others in the culture as "normal practice." Residents who can think in this way, i.e., constantly identifying and reassessing the underlying cultural assumptions driving attitudes and behavior in the larger group (and in the particular setting in which they work at a given time), become the kinds of change agents that can evolve their practice as the environment, technology, and medical science demand.

HOW THE RESIDENCY WORK CONTEXT SHAPES THE LEARNING CULTURE

Aspects of the everyday residency work context enhance or undermine the prospects for the attitudes, behaviors, and interactions associated with a learning culture and, subsequently, the existence of the five learning disciplines, i.e., personal mastery, shared mental models, shared vision, team learning, and systems thinking. Thus, simply desiring to have a residency program embrace specific attitudes, behaviors, and interactions is not enough. There need to be conditions present within the residency setting to maintain a learning-oriented culture. Empirical evidence suggests that attitudes and behaviors such as inquiry, reflection, empathy, trust, cooperation, creative tension, shared vision, and systems thinking are found in less than sufficient degrees across residency settings.[9–11] For example, cognitive processes like denial and distancing have been found to be more common among residents than self-reflection and openness in dealing with medical error.[5,11,12] There is also shown to be less creative dialogue and inquiry between levels of the training hierarchy related to improving systems of care and to dealing with the effect that negative work experiences have on the resident's sense of competence.[9,11–14] Finally, studies show the tendency towards top-down rather than reciprocal communication flows within residencies, with experienced physicians' views given more legitimacy than the views of less experienced physicians.[9,14–16]

Resident work contexts must promote several conditions to encourage the practices described above. These include provision of adequate downtime, minimizing fatigue, and optimizing workload. Residents must have adequate downtime available in their workday (as the complexity of their responsibilities, illustrated in Figure 1, makes clear). Residents need opportunity to engage in individual activities such as self-reflection and personal forgiveness. They also should have opportunities to interact with other resident and attending physicians in order to engage in practices like mutual support, the sharing of experiences, inquiry, and empathy. For residents, however, downtime is in short supply. The accepted norm within the profession is that being a "good" resident involves "working hard," which is not often defined to mean taking time out of the workday to find a quiet place and think on one's (or someone else's) immediate behavior, or to seek out an attending physician or resident solely to (for example) express concern for another resident's situation or share a recent experience in a group context. Many residents are unable to take time during the work day to engage in any activities that do not further their ability to meet attendings' or senior residents' expectations of being a diligent, hard-working resident.

The recent ACGME incorporation of the 80-hour resident workweek into the institutional requirements of programs could function either as a blessing or curse in the area of time for the resident.[17] On the positive side, it may provide greater opportunity for the resident to engage in some of the best practices listed in Table 2. Yet, this opportunity will likely need to be pursued outside the residency setting, as residency programs and the organizations to which they provide labor feel squeezed to get in other required educational and task-oriented resident duties within 80 hours. Ironically, the 80-hour workweek, by further compressing the time in which residents must do their work, may thus undermine the ability of a residency program or health care organization to cultivate a learning-oriented culture as defined by the practices in Table 2. Add to this the documented problem of bad time management on the part of many residents, and the 80-hour workweek becomes even less of a boon for encouraging individual engagement in practices such as inquiry, self-reflection, and dialogue.[18]

Fatigue is a second contextual feature of the everyday setting that presently appears to affect residents in ways not conducive to promoting learning practices.[19] It is contextual because while it is the resident who experiences the fatigue, it is the surrounding work environment that plays a pivotal role in causing that fatigue. Fatigue generally causes cognitive impairment, reduced motivation, enhanced cynicism, and results in less energy available for creative, self-directed activities such as reflection, inquiry, and examining failure.[20] Within the residency environment, fatigue has been shown to lessen clinical performance and quality of care, lengthen the time needed to perform routine tasks, decrease attention span, cause more mistakes, and decrease the residency's ability to think creatively.[21–23] Residents themselves cite fatigue as a major factor hampering their overall performance.[24,25]

The norm in most clinical specialties continues to be to test the residents' mettle by subjecting them to extended periods of exhaustion as they conduct their work, through on-call, patient rounding, and "scut" responsibilities that make resident workdays look more like clinical triathlons designed to test the limits of physical and mental endurance. For some residents, sleep deprivation is an almost daily occurrence, while almost all experience a meaningful amount of exhaustion during their residency experience. If duties directly related to patient care stand to suffer as a result of resident fatigue, as evidence suggests, then the kinds of practices listed in Table 2 suffer even more, since they may be considered a "luxury" for the resident and thus something easily jettisoned when exhaustion occurs.

Engaging in learning-oriented attitudes and behaviors requires rested, focused residents who can actively engage themselves and the group in ways that: (1) are not necessarily a natural part of the everyday work environment at present, and (2) often involve some momentary unpleasantness in revealing to oneself and superiors problems in the training process. Although one could argue that the 80-hour workweek requirement will produce less fatigued residents, there is no reason to think that is an automatic outcome. Having to work even 80 hours in any workweek, least of all one involving the kind of work physicians perform, is still excessive when considering what it takes to become an active and engaged learner. How many individuals in the course of their normal jobs, jobs that often involve much less responsibility and decision making skill, work 80 hours a week and still function at the peak of their learning potential? How proactive, creative, and interested might we expect someone to be in his or her (or someone else's) learning while pulling shifts of 12 hours or more six days a week?

Workload issues in hospitals provide a third aspect of the surrounding context that undermines the potential for a learning culture to occur around residency training. Nursing shortages, changes in reimbursement, sicker patients, changes in funding formulas that have limited the growth of residency programs, and fewer on-staff attending physicians conspire to create a situation where residents and their attending mentors across the country are working harder in hospitals.[26] Working harder may be in keeping with the norm of being a "good" resident, but it means less time available for learning, fewer interactions with attending physicians, greater fatigue, and other negative outcomes (e.g., decreased job satisfaction, increased burnout) not conducive to engaging in the attitudes and behaviors needed to

fulfill the requirements of a learning-oriented culture. Attending physicians, fellows, and chief residents spend much less direct teaching time with residents than presumed, largely because of increasing patient and administrative responsibilities and the increasing numbers of residents under their supervision.[27,28] Residents also face situations in which an active focus on learning cannot be sustained throughout the workday, as they grapple with paging disruptions and interactions (e.g., with nurses, other services, attending physicians) that often address mundane rather than important issues.[29,30]

Lack of downtime, greater fatigue, and increased workload are three contextual factors that currently undermine the possibility for a learning culture to occur in residency training. Other contextual factors worth mentioning include the quality of the physician–nurse collaborative climate present in the resident's work environment, the extent of supervisory access in the environment, and the type of balance maintained by the resident between work and nonwork interests and demands. For example, a high degree of physician–nurse collaboration in the resident's work setting enhances the chances that the resident can engage in practices like inquiry, feedback, forgiveness of one's self, empathy, and consensus building. This is mainly because nurses represent an "outside" group in whom residents can confide; a group to be used for sharing concerns, ideas, and doubts. It is well-known that interns and junior residents come into more contact with nurses in the course of a normal day than with attending physicians or senior residents. A positive collaborative climate also decreases the level of overall tension within the work environment, encouraging individuals to be more communicative: sharing experiences, asking questions, and expressing doubt or uncertainty.

Balance between work and nonwork domains is a critical component of creating an active learner.[4] It allows individuals to place work in its proper context and to be psychologically well adjusted in their overall lives. It is linked directly to the discipline of self-mastery. Having enough time to pursue nonwork interests that offer respite and time away from work responsibilities and pressures, in addition to being allowed to engage in roles such as spouse and parent that offer personal rewards and satisfaction, result in a more engaged and willing learner. Residents worry about maintaining some degree of balance between their work and nonwork lives.[31] Yet, existing residency training often sends a signal to young physicians that a productive, satisfying nonwork life is a luxury rather than necessity in relation to their training. Nonwork rewards are considered an appropriate "sacrifice" to be made by residents in order to become technically competent doctors. However, the lack of a rich nonwork life produces more cynicism toward work, less enthusiasm for the proactive behaviors required for learning, and increased job burnout.

Finally, the structure of supervisory access in any residency setting helps to determine the extent to which a learning culture can exist. Residents across a variety of clinical specialties have limited access to their attending physicians.[32,33] This access is often confined to a few hours of teaching rounds per day, assisting on procedures on the floor or in the operating room, or in formal conferences. However, practices such as inquiry, dialogue, feedback, openness, sharing experiences, and creative tension rely upon frequent and close interaction between residents and attending physicians throughout the day. They also demand easy, on-the-spot access to these individuals higher up in the training hierarchy. Interaction and access of this kind build trust within the group. This trust creates a degree of "psychological safety" for interns and junior residents, making them feel like they can become contributing members of the group, despite their less experienced place in the training hierarchy.[34]

WHAT MUST BE DONE?

If the culture and work context of residents' everyday life can foster or inhibit their ability to develop into competent physicians, then those features that foster must be identified, prioritized, and measured on an ongoing basis. How best to pursue these aims should be subjected to extended debate within the medical profession. The emphasis on culture and context emphasize organizational and program accountability much more clearly than do the competencies. Part of the initial discussion should revolve around an attempt to describe the components of an "ideal" training environment across residency situations rather than digressing to entrenched norms about medical training that derive in part from "the way things have always been done" and an "I had to do it" mentality within the profession. Just as leaders of other industries have done when those industries have come to critical junctures where greater learning capacity must be created, medical educators need to begin with a blank slate and ask, "If we wanted to start from scratch and create the most favorable work environment for resident learning, what would it look like?"

This development of an ideal, from which residency programs can measure actual deviations, may be done through the development of cultural "templates" that serve as blueprints for creating specific work environments for residents. The use of templates is commonly found in formal evaluation studies of program implementation and in fields such as education.[35] It has also been used by professions such as nursing and teaching to improve upon training curricula or develop new educational programs.[36] A key goal in the development of cultural templates is to identify the individual, group, and organizational barriers that must be overcome in the setting to move more towards a desired type of

everyday culture. A template could also serve as a focused assessment tool for monitoring how the actual residency culture matches up with the desired one. Documenting deviations from the desired culture could be done periodically in the same manner as the core competencies are assessed. That is, through periodic assessments done by residency programs using tools such as surveys of individuals (e.g., 360-degree evaluations), direct observations of work settings and resident teams, and interviews or focus groups involving attending physicians, residents at all levels, and other key nonphysician stakeholders such as nurses and patients. Performing such an assessment annually, in concert with assessing core competencies among residents in a given program, would provide a comprehensive and well-rounded view of the educational experience within a residency program.

Each individual resident is part of a larger health care delivery work context and culture. It is this context and culture that helps determine the capacity of the individual resident to learn.[7,8] Creating the right environment for the acquisition of core competencies is the responsibility of residency programs and health care organizations like hospitals. At the present moment, the profession is confronting the question of how to make residents, as the future-physician "parts" of the health care system, better. It is important to turn the focus next to the larger whole in which these individual parts ply their trade. This focus is systems thinking at its finest. It acknowledges that the process through which residents become competent practitioners has as much to do with the everyday world surrounding their training as it has to do with their own brainpower and hard work.

REFERENCES

1. Accreditation Council for Graduate Medical Education Endorsed General Competencies for Residents. ⟨http://www.acgme.org/outcome/comp/compFull.asp#1⟩. Accessed 1 May 2002. ACGME, 2001.
2. Leach DC. Changing education to improve patient care. Qual Health Care. 2001;10(II suppl):54–8.
3. Branch WT, Paranjape A. Feedback and reflection: teaching methods for clinical settings. Acad Med. 2002;77:1885–8.
4. Senge P. The Fifth Discipline: The Art and Practice of the Learning Organization. New York: Currency and Doubleday, 1990.
5. Fox RC. Training in caring competence. In: Lloyd H, Hendric (eds). Educating Competent and Humane Physicians. Bloomington: Indiana University Press, 1990:199–216.
6. Senge P. It's the learning: the real lesson of the quality movement. J Qual Particip. 1999;22:34–40.
7. Argyris C. Organizational Learning. Malden, MA: Blackwell Publishers, 1999.
8. Schein EH. Organizational Culture and Leadership. San Francisco: Jossey Bass Publishers, 1992.
9. Bosk CL. Forgive and Remember: Managing Medical Failure. Chicago: University of Chicago Press, 1979.
10. Wu AW, Folkman S, McFee SJ, Lo B. Do house officers learn from their mistakes? JAMA. 1991;265:2089–94.
11. Mizrahi T. Managing medical mistakes: insularity and accountability among internists-in-training. Soc Sci Med. 1984;19:135–46.
12. Sexton BJ, Thomas EJ, Helmreich RL. Error, stress, and teamwork in medicine and aviation: cross-sectional surveys. BMJ. 2000;320:745–9.
13. Hilfiker D. Sounding board: facing our mistakes. N Engl J Med. 1984;310:118–22.
14. Light DW. Psychiatry and suicide: the management of a mistake. Am J Sociol. 1973;77:821–38.
15. Becker HS, Strauss A, Hughes EC. Boys in White: Student Culture in Medical School. Chicago: University of Chicago Press, 1961.
16. Millman M. The Unkindest Cut: Life in the Backrooms of Medicine. New York: Morrow and Company, 1976.
17. Friedmann P, Williams WT (co-chairmen). Report of the ACGME Work Group on Resident Duty Hours. Chicago: Accreditation Council for Graduate Medical Education, 2002.
18. Yao DC, Wright SM. National survey of internal medicine residency program directors regarding problem residents. JAMA. 2000;284:1099–104.
19. Clark PA. What residents are not learning: observations in an NICU. Acad Med. 2001;76:419–24.
20. Krueger GP. Fatigue, performance, and medical error. In: Bogner MS (ed). Human Error in Medicine. Hillsdale, NJ: LE Assoc, 1994.
21. Gaba DM, Howard SK, Jump B. Production pressure in the work environment: California anesthesiologist's attitudes and experiences. Anesthesiology. 1994;81:488–500.
22. Owens JA. Sleep loss and fatigue in medical training. Curr Opin Pulm Med. 2001;7:411–18.
23. Samkoff JS, Jacques CH. A review of studies concerning effects of sleep deprivation and fatigue on resident's performance. Acad Med. 1991;66:687–93.
24. Weinger MB, Ancoli-Israel S. Sleep deprivation and clinical performance. JAMA. 2002;287:955–7.
25. Daugherty SR, Baldwin DC Jr, Rowley BD. Learning, satisfaction, and mistreatment during medical internship: a national survey of working conditions. JAMA. 1998;279:1194–9.
26. Defoe DM, et al. Long hours and little sleep: work schedules of residents in obstetrics and gynecology. Obstet Gynecol. 2001;97:1015–8.
27. Abrass CK, Ballweg R, Gilshannon M, Coombs JB. A process for reducing workload and enhancing residents' education at an academic medical center. Acad Med. 2001;76:798–805.
28. Kim SC, Giardino AP, Casey R, Magnusson MR, Pinto-Martin JA. Experiences and reflections of former pediatric chief residents. Arch Pediatr Adolesc Med. 1994;148:518–21.
29. Melgar T, Schubiner H, Burack R, Aranha A, Musial J. A time-motion study of the activities of attending physicians in an internal medicine and internal medicine-pediatrics resident continuity clinic. Acad Med. 2000;75:1138–43.
30. Beebe SA. Nurses' perception of beeper calls: implications for resident stress and patient care. Arch Pediatr Adolesc Med. 1995;149:187–91.
31. Yedida MJ. Doctors as workers: work-hour regulations and interns'perceptions of responsibility, quality of care, and training. J Gen Intern Med. 1993;8:429–35.
32. Malone ML, Steele DJ, Jackson TC. What do senior internal medicine residents do in their continuity clinics? J Gen Intern Med. 1993;8:185–8.
33. Nerenz D, Rosman H, Newcomb C, et al. The on-call experience of interns in internal medicine. Arch Internal Med. 1990;150:2294–7.
34. Edmondson A. Psychological safety and learning behavior in work terms. Admin Sci Q. 1999;44:350–83.
35. Loucks-Horsley S. The design of templates as tools for formative evaluation. New Dir Prog Eval. 1996;75:5–24.
36. Mawn B, Reece S. Reconfiguring a curriculum for the new millennium: the process of change. J Nurs Educ. 2000;39:101–8.
37. Schon D. The Reflective Practitioner. New York: Basic Books, 1983.

Teaching and Learning Moments

HOLDING HANDS

From the first moment I met Katie until the day of her final visit, two things were always clear: her fierce independence and her love for those around her. At 84 years old, she still lived in and maintained the only house she and her husband had ever owned, and had refused requests from family to move after the death of her husband. Outside of assistance from a food bank and occasional medicine reviews from her nephew, Katie made it consistently clear that she was doing fine on her own, despite the limitations brought on by her severe congestive heart failure.

Katie's independent lifestyle went on for several years after her husband's death, but one day, Katie's nephew placed a frantic call to my office, reporting bags of unopened food from the food bank left on the porch and pill sorters with the week's pills untouched. Katie was having trouble breathing, and the leg swelling was worse than he had ever seen it before. "We have to do something, doc. She looks terrible!" he pleaded. I asked him to bring her to the office as soon as he could.

When they arrived, I felt the gravity her nephew had been trying to convey. Katie looked ashen, almost green. Yet her eyes had their same familiar warmth that had made my day on so many occasions. Her cold hands gave away the truth that her eyes would not, that her cardiovascular system was tasked to its limit. While her nephew presented the evidence of her overt noncompliance, Katie just smiled and held my outstretched hand, occasionally darting her eyes as if to enter a guilty plea. An examination confirmed my suspicions that Katie was suffering from severely decompensated heart failure.

"You must let me help you, Katie. Please let me put you in the hospital." Her nephew nodded vigorously behind me, offering a definitive second opinion.

"Oh, no, doctor, I don't want to do that. I'll be fine. Don't you worry." Her nephew caught my despairing look, and returned one of his own. Only Katie remained the beacon of serenity.

Katie refused my advice and went home, where she passed away alone 12 hours later, on the day of her 59th wedding anniversary. Helpless feelings tortured me. Why would she come to see me, if she wouldn't accept my advice? I replayed the visit over and over in my head: her nephew's despair, my frustration, and Katie's serenity until I finally saw what I had missed all along. Katie didn't come to that final visit to receive my advice. She came to comfort me, to say goodbye. The hand I thought I was holding was actually holding mine.

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