Four Fundamental Educational Principles

Kenneth M. Ludmerer, MD, MACP

Although residency is situated in patient care, its societal mission is education. It is through residency that individuals are transformed from novices into experienced professionals, providing society with competent and compassionate healers for the future.

Producing outstanding physicians and surgeons poses no easy task, in part because medical knowledge and practice are growing and changing at an increasing rate. Accordingly, physicians need to understand scientific methods and principles, acquire and assimilate new information, think critically, and remain skeptical of traditional teachings. Finally, medical practice is rife with risk and uncertainty, and physicians need the skill and wisdom to manage the perplexing uncertainties they will face.[1–3]

At its best, the residency experience must be conducted as professional education, not as vocational training. This means preparing residents to adapt to the future, not merely learn for the here and now, and encouraging residents to read and deepen their understanding. Professional education instills an understanding of *why* something should be done, not just what to do. It must involve reflection on the values of the profession, the role of the doctor in the community, and the responsibilities of the profession to create a better health care system and a healthier society. It involves intellectual inquiry, not merely practical training for the job.[1]

Even as the specifics of medical knowledge and practice change, 4 cardinal educational principles have been recognized to underlie residency training. They encompass (1) the assumption of responsibility for patient management; (2) the opportunity to engage in reflective learning; (3) ensuring that residents are not burdened with nonmedical tasks; and (4) continuity of care.

The Assumption of Responsibility

It is axiomatic that an individual is not a mature physician until he or she has learned to assume full responsibility for patient management. For safety and learning, residents are supervised by, and accountable to, attending physicians. In practice moment-by-moment supervision may be provided by more experienced resident colleagues.

The model of progressive independence has been justified by its powerful intuitive appeal, and the positive perceptions of generations of teachers and learners.[4] In addition, it receives strong support from the psychology literature, where Dreyfus and Dreyfus[5] advanced a model of 5 stages of skill acquisition: novice, advanced beginner, competent, proficient, and expert, and applied it to the acquisition of competence in medicine.[6]

Balancing the educational needs of residents, who require increasing independence, with the safety of patients, who may benefit from being cared for by the most experienced physician available, presents challenges. This problem has become particularly acute in recent years, as hospitalized patients have become sicker, hospital stays shorter, and medical practice ever more sophisticated.

There is robust data linking medical errors to inadequate supervision of trainees, with research showing that closer supervision leads to improved quality of care.[7–10] Supervision in residency is "the provision of monitoring, guidance and feedback on matters of personal, professional and educational development in the context of the doctor's care of patients."[11(p828)] This includes the ability "to anticipate a doctor's strengths and weaknesses in particular clinical situations, in order to maximize patient safety."[11(p828)] Good supervision provides benefits beyond promoting patient safety: the opportunity for residents to observe experienced, caring physicians modeling exemplary professional behavior.

There are different levels of supervision, ranging from direct involvement with care to retrospective review of residents' actions.[12] Current evidence suggests that the supervisory relationship is the single most important factor for the effectiveness of supervision, far more important than the particular supervision methods used.[11] Especially important in this relationship are continuity over time, the supervisor's skill at discharging oversight responsibilities while preserving sufficient intellectual autonomy for trainees, and the opportunity for both trainee and supervisor to reflect on their work.[11] Other qualities of effective supervisors are listed in the BOX.

DOI: http://dx.doi.org/10.4300/JGME-D-16-00578.1

Editor's Note: This special essay is an abbreviated version of a document that was provided to the ACGME Phase 1 Task Force focused on Section VI, Resident Duty Hours in the Learning and Working Environment in June 2016. The complete document is available on request by contacting JGME *Staff at jgme@acgme.org.*

Good supervisors are made, not born, with evidence that faculty can be taught to be better teachers and supervisors.[11,13–15] An advantage of proper supervision is the role modeling it offers residents for the supervision that they themselves may later provide to others. However, good clinical supervision is time-consuming. Many faculty members find it difficult to allocate the necessary time due to pressures to increase clinical or research "productivity." For good supervision to flourish, medical schools will need to prioritize and fund education, through willingness to promote clinician-educators, specific budgeting for education, and other strategies to value and reward clinical teaching and supervision.[16]

Even with improved supervision, programs must encourage residents to assume responsibility for patient care, lest they emerge from training ill-prepared for independent practice. This places great responsibility on trainees to call for help when they need it. The culture of residency may discourage asking for help. Residents must feel free to call for help; they must not fear recriminations.[17–19] Acknowledging what one does not know and asking for help when needed are core ingredients of professionalism.

BOX Qualities of Effective Supervisors[11]

- Supervisors need to be clinically competent and knowledgeable, and have good teaching and interpersonal skills.
- The supervising relationship changes as the trainee gains experience and competence.
- Trainees need clear feedback about their errors; corrections must be conveyed unambiguously so that trainees are aware of mistakes and weaknesses.
- Helpful supervisory behaviors include giving guidance on clinical work, linking theory and practice, solving problems jointly, offering feedback and reassurance, and role modeling.
- Ineffective supervisory behaviors include rigidity, intolerance, lack of empathy, failure to offer support, failure to follow trainees' concerns, lack of concern with teaching, and overemphasis on the evaluative aspects of supervision.

Reflective Learning

From the beginning of the modern residency, educators have emphasized the importance of allowing residents to reflect on their work. It is better for residents' intellectual growth to study fewer patients in depth than more patients superficially.[20(p270)]

The education and psychology literature describes "reflective learning"[21] and "mindfulness"[22] as essential for learning. With the 1984 implementation of prospective payment for hospitals, the average severity of illness of hospitalized patients increased, the number of patients admitted per night roughly tripled, and the average length of hospital stay fell by one-third.[1] The limits on resident duty hours implemented in 2003 may have worsened this situation. Residents are limited to 80 hours per week in the hospital, but their workload has not decreased.[23] The already hectic pace at which they worked became even faster, a phenomenon that became known as "work compression."[23]

During the past 3 decades residents have become remarkably adept at admitting and discharging patients. Yet, frequently, learning is marginalized."[24(p83)] An ethnographic study of graduate medical education (GME) found that when residents are deluged with admissions, ''discharge becomes the primary goal."[25(p151)] The result is a less questioning attitude, a tendency not to challenge authority, overemphasis on learning facts, diminished focus on fundamental principles and problem-solving skills, and little contemplation of the larger purposes of medicine, or the moral meaning of being a doctor.[25] A related change is that residency may have become less fulfilling with a loss of a sense of completion, joy derived from the pursuit of excellence, and pride in a job well done.[1] Growing numbers of residents may feel that residency is just a job. Residents may become frustrated by an environment that does not let them heal or learn as they had hoped. Those who seek to address the problems of burnout and depression among today's residents should pay heed to the pressures of patient "throughput" and loss of opportunities for reflection in the present-day learning environment.

Primacy of Education

In principle, GME is about education, thus educational value should be the primary determinant of any services residents provide. A central fault line in the residency system is tension between "education" and "service."

In the contemporary era of high throughput medicine, residents find themselves buried under new administrative chores: scheduling tests and procedures, requesting consultations, facilitating discharge plans, and endless other computer documentation. One study found residents devoting as much as 35% of their time to activities of either marginal or no educational value, which reduces the time available for reflective learning and careful patient management.[26]

Continuity of Care

Continuity of care has many benefits, including better preventive services, clinical outcomes, patient satisfaction and trust, and economic efficiencies.[27,28] Continuity also is a core educational principle, with

justification in modern learning theory.[29–31] Continuity allows residents to witness the success of their attempts at problem-solving, observe the results of diagnostic and therapeutic procedures, and appreciate the full course of disease and treatments.

Continuity of care also is fundamental to residents' moral development. A powerful motivator for learning is learners' sense of deep commitment to patients. Continuity connects residents' desire to serve with their desire to learn. Learners typically enter the study of medicine highly idealistic, altruistic, and desirous of serving. Studies show the attrition of these qualities during medical school and residency, with the emergence of cynicism and a sense of entitlement.[32] Attention to educational continuity has the potential to forestall such erosion.[29]

Duty hour regulations established in 2003 had the inadvertent consequence of disrupting inpatient continuity of care. The current rules limit first-year residents to 16 hours and require upper-level residents to be out of the hospital within 4 hours of completing a 24-hour shift. Such forced departures may interrupt the natural patient care and educational flow of the workday, and thus challenge educational continuity. Residents frequently have to hand off critically ill patients to others; opportunities to talk with patients and families are similarly truncated.

Many residents voice frustration with a bureaucratic, inflexible system that forces them to choose between falsifying duty hour reports and providing patient care.[33] Instead, GME needs a system that inspires residents to do their best, rather than congratulating them for leaving and scolding them for tending to patients' needs.

Concluding Observations

Excellence in residency training is not a matter of curricula, lectures, conferences, or books and journals, as valuable as these components are. Nor is it a matter of compliance with rules and regulations. Excellence depends on the intangibles of the learning environment: the skill and dedication of the faculty, the ability and aspirations of trainees, the opportunity to assume responsibility, the freedom to pursue intellectual interests, and the presence of high standards and high expectations. With these elements in place, excellence is likely and the system will provide a genuinely professional education.

The educator's gaze needs to be on the totality of the learning environment, with consideration of the number and complexity of resident cases, supervision, continuity of care, reducing the burden of nonmedical chores, and the degree to which programs infuse their residents with excitement and inspiration.

References

1. Ludmerer KM. *Let Me Heal: The Opportunity to Preserve Excellence in American Medicine*. New York, NY: Oxford University Press; 2014.
2. Ludmerer KM. *Time to Heal: American Medical Education From the Turn of the Century to the Era of Managed Care*. New York, NY: Oxford University Press; 1999.
3. Fox RC. Training for uncertainty. In: Merton RK, Reader GG, Kendall PL, eds. *The Student-Physician: Introductory Studies in the Sociology of Medical Education*. Cambridge, UK: Harvard University Press; 1957:207–241.
4. Kennedy TJ, Regehr G, Baker GR, et al. Progressive independence in clinical training: a tradition worth defending? *Acad Med*. 2005;80(suppl 10):106–111.
5. Dreyfus HL, Dreyfus SE. Five steps from novice to expert. In: Dreyfus HL, Dreyfus SE. *Mind Over Machine*. New York, NY: The Free Press; 1986:16–51.
6. Batalden P, Leach D, Swing S, et al. General competencies and accreditation in graduate medical education. *Health Aff (Millwood)*. 2002;21(5):103–111.
7. Gennis VM, Gennis MA. Supervision in the outpatient clinic: effects on teaching and patient care. *J Gen Intern Med*. 1993;8(7):378–380.
8. Sox CM, Burstin HR, Orav EJ, et al. The effect of supervision of residents on quality of care in five university-affiliated emergency departments. *Acad Med*. 1998;73(7):776–782.
9. Fallon WF Jr, Wears RL, Repas JJ III. Resident supervision in the operating room: does this impact on outcome? *J Trauma*. 1993;35(4):556–560.
10. Singh H, Thomas EJ, Petersen LA, et al. Medical errors involving trainees: a study of closed malpractice claims from 5 insurers. *Arch Intern Med*. 2007;167(19):2030–2036.
11. Kilminster SM, Jolly BC. Effective supervision in clinical practice settings: a literature review. *Med Educ*. 2000;34(10):827–840.
12. Kennedy TJ, Lingard L, Baker GR, et al. Clinical oversight: conceptualizing the relationship between supervision and safety. *J Gen Intern Med*. 2007;22(8):1080–1085.
13. Litzelman DK, Marriott DJ, Stratos GA, et al. Factorial validation of a widely disseminated educational framework for evaluating clinical teachers. *Acad Med*. 1998;73(6):688–695.
14. Williams PL, Webb C. Clinical supervision skills: a Delphi and critical incident technique study. *Med Teach*. 1994;16(2–3):139–157.
15. Bishop V, ed. *Clinical Supervision in Practice: Some Questions, Answers, and Guidelines for Professionals in Health and Social Care*. Basingstoke, England: Palgrave Macmillan; 1998.

16. Ludmerer KM. Learner-centered medical education. *N Engl J Med*. 2004;351(12):1163–1164.
17. Shojania KG, Fletcher KE, Saint S. Graduate medical education and patient safety: a busy—and occasionally hazardous—intersection. *Ann Intern Med*. 2006;145(8):592–598.
18. Loo L, Puri N, Kim DI, et al. "Page me if you need me": the hidden curriculum of attending-resident communication. *J Grad Med Educ*. 2012;4(3):340–345.
19. Farnan JM, Johnson JK, Meltzer DO, et al. Resident uncertainty in clinical decision making and impact on patient care: a qualitative study. *Qual Saf Health Care*. 2008;17(2):122–126.
20. Flexner A. *Medical Education: A Comparative Study*. New York, NY: Macmillan Co; 1925.
21. Plack MM, Greenberg L. The reflective practitioner: reaching for excellence in practice. *Pediatrics*. 2005;116(6):1546–1552.
22. Epstein RM. Mindful practice. *JAMA*. 1999;282(9):833–839.
23. Auger KA, Landrigan CP, Gonzalez del Rey JA, et al. Better rested, but more stressed? Evidence of the effects of resident work hour restrictions. *Acad Pediatr*. 2012;12(4):335–343.
24. Ryan J. Unintended consequences: the Accreditation Council for Graduate Medical Education work-hour rules in practice. *Ann Intern Med*. 2005;143(1):82–83.
25. Cooke M, Irby DM, O'Brien BC. *Educating Physicians: A Call for Reform of Medical School and Residency*. San Francisco, CA: Jossey-Bass; 2010.
26. Boex JR, Leahy PJ. Understanding residents' work: moving beyond counting hours to assessing educational value. *Acad Med*. 2003;78(9):939–944.
27. Ellman MS, Tobin DG, Stepczynski J, et al. Continuity of care as an educational goal but failed reality in resident training: time to innovate. *J Grad Med Educ*. 2016;8(2):150–153.
28. Warm E. Continuity—working backward from the patient. *J Grad Med Educ*. 2016;8(1):101–103.
29. Hirsh DA, Ogur B, Thibault GE, et al. Continuity as an organizing principle for clinical education reform. *New Engl J Med*. 2007;356(8):858–866.
30. Metz D, Chard D, Rhodes J, et al, eds. Continuity of Care for Medical Patients: Standards of Good Practice. London, UK: Royal College of Physicians; 2004. https://cdn.shopify.com/s/files/1/0924/4392/files/contin_care_report_web.pdf?2801907981964551469. Accessed October 24, 2016.
31. Bransford JD, Brown AL, Cocking RR, et al, eds. *How People Learn: Brain, Mind, Experience, and School*. Washington, DC: National Academy Press; 2000.
32. Neumann M, Edelhäuser F, Tauschel D, et al. Empathy decline and its reasons: a systematic review of studies with medical students and residents. *Acad Med*. 2011;86(8):996–1009.
33. Drolet BC, Schwede M, Bishop KD, et al. Compliance and falsification of duty hours: reports from residents and program directors. *J Grad Med Educ*. 2013;5(3):368–373.

Kenneth M. Ludmerer, MD, MACP, is At Large Director, Mabel Dorn Reeder Distinguished Professor of Medicine and the History of Medicine, School of Medicine, Washington University in St. Louis.

Corresponding author: Kenneth M. Ludmerer, MD, MACP, St. Louis Children's Hospital, 4950 Children's Place, St. Louis, MO 63110, 314.362.8073, kludmere@im.wustl.edu