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References

1 Scott DR, Weimer M, English C, et al. A novel approach to increase residents' involvement in reporting adverse events. Acad Med. 2011;86:742–746.
2 McNeil JJ, Ogden K, Briganti E, Ibrahim JE, Loff B, Majoor JW. Chapter 2: Literature review. In: Improving Patient Safety in Victorian Hospitals. Melbourne, Victoria, Australia: Department of Human Services; 2000:5–21.
3 Clarke S. Perceptions of organizational safety: Implications for the development of safety culture. J Organ Behav. 1999;20:185–198.
4 Woodward HI, Mytton OT, Lemer C, et al. What have we learned about interventions to reduce medical errors? Annu Rev Public Health. 2010;31:479–497.
5 Olsen S, Neale G, Schwab K, et al. Hospital staff should use more than one method to detect adverse events and potential adverse events: Incident reporting pharmacist surveillance and local real-time record review may have a place. Qual Saf Health Care. 2007;16:40–44.

In Reply: We thank Ms. Kelaart for her thoughtful response. We agree with her emphases that health care organizations must engineer a culture of safety, and that true cultural change requires support from stakeholders at all levels of the organizational hierarchy. We believe our intervention succeeded because of close collaboration among leaders from multiple stations: the chief operational and medical officers atop the organizational hierarchy, the director of the Office of Graduate Medical Education, the director of our institution's safety office, and residents. This union represented a melding of "top-down" and "bottom-up" approaches for quality improvement, as outlined by the Accreditation Council for Graduate Medical Education and the Institute for Health care Improvement.[1]

We also agree that, ideally, research on an organization's safety performance should include senior mangers' attitudes and behaviors. However, we limited the intervention's focus to residents, largely because the project's conception and enthusiasm developed among resident leaders. Also, resident physicians have a marginalized status, incomplete cultural indoctrination, and a transitional role between care delivery and care leadership. These features make residents particularly important targets for education to develop new leaders in a culture of safety, where reporting would be viewed as simple, common, and nonpunitive. We did not offer attending physicians the financial incentive or education that we offered the residents and, instead, chose to report their behavior as a contemporaneous control, noting their incident reporting did not change during the study period. This was done primarily to demonstrate the absence of confounding factors. However, senior professionals represent vital role models, and we recommend their inclusion in future research on and implementation of comprehensive safety initiatives.

We acknowledge that voluntary incident reporting systems often have weaknesses. Without a linked system to exploit those reports for improvement, they lack evidence for improving patient-level outcomes. However, incident reporting fulfills an essential and expanding role when used within a multimodal system to identify events and threats and to target interventions and monitor results.[2] We acknowledge that augmenting incident reports with other safety monitoring systems provides a more comprehensive risk profile, the tradeoff being greater costs. Housestaff physician reporting, as compared to records review, is less costly and detects more preventable events, which can serve as targets for quality improvement.[3] Resident participation in event reporting is valuable, and should be included as part of a multifaceted approach to both study and improve patient safety.

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References

1 Philibert I. Involving residents in quality improvement: Contrasting "top-down" and "bottom-up" approaches. Accreditation Council for Graduate Medical Education; 2008. www.acgme.org/acWebsite/ci/90DayProjectReportDFA_PA_09_15_08.pdf. Accessed on February 1, 2012.
2 O'Neil AC, Petersen LA, Cook EF, et al. Physician reporting compared with medical-record review to identify adverse medical events. Ann Intern Med 1993;119:370–376.
3 Leape LL. Reporting of adverse events. N Engl J Med 2002;347:1633–1638.

Toward a Better Understanding of the Retention of Physician–Scientists in the Career Pipeline

To the Editor: We question the implications of the study by Jeffe and Andriole,[1] who assembled a novel database from disparate sources to investigate the role of Medical Scientist Training Program (MSTP) funding for MD/PhD student training. MSTPs (i.e., MSTP programs) were stratified by duration of MSTP funding to their respective institutions. As reported in Table 2, recent MSTPs were more similar in student prematriculation characteristics to non-MSTPs than they were to long-standing MSTPs. Because the authors did not compare all MSTPs with all non-MSTPs, their concluding recommendation that future studies take into account the MSTP funding status of MD/PhD trainees should be evaluated with the duration of MSTP funding to the institution in mind.

The authors found that female and minority students were more likely to graduate from long-standing MSTPs than from non-MSTPs. However, the analysis did not normalize the ethnic and gender diversity of the MD/PhD cohort to the overall medical student cohort at each respective school. Thus, it is unclear whether the increased diversity is due to MSTP funding or certain institution-specific factors. Intra-institutional normalization could also have been performed on other variables (e.g., MCAT score and the undergraduate institution's Carnegie Classification).

Another potential confounder of the analysis is the research milieu in which the long-standing MSTPs function, that is, the home medical school. For example, as a crude analysis, out of the 43 medical schools with MSTPs in 2010–2011, 36 (84%) were concurrently among the top 43 medical school recipients of NIH

funding in 2010.[2] We maintain that the institutional environment plays a more integral role in the development of physician–scientists than does the funding mechanism. Institutions giving higher priority to research are more likely to have invested in the proper infrastructure and resources to support MD/PhD students and to fully fund them. With the authors' finding of increased MD/PhD graduate debt linked to increased likelihood of pursuing a nonuniversity clinical practice, further investigation is warranted regarding the role of institutional trainee support, level of financial support, and sources of funding beyond MSTP support alone.

Based on Table 4, there was no significant difference between long-standing MSTP, recent MSTP, and non-MSTP graduates regarding pursuing a career outside that of full-time faculty/research scientist. This suggests that obtaining both the MD and PhD degrees, regardless of MSTP funding, is in itself sufficient for this outcome. However, a comparison of the students' research career intentions at the time of matriculation—from the AAMC Matriculating Student Questionnaire (MSQ)—with their intentions at the time of graduation would have been a better measurement of the influence of MSTP funding on the persistence of career intentions. The fact remains that no studies have shown the predictive value of career intentions on actual outcomes.[3,4]

Incorporating information from the MSQ and implementing postgraduation longitudinal studies would provide a better understanding of the impact of factors such as training environment and funding support on the retention of physician–scientists in the career pipeline.

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References

1 Jeffe DB, Andriole DA. A national cohort study of MD–PhD graduates of medical schools with and without funding from the National Institute of General Medical Sciences' Medical Scientist Training Program. Acad Med. 2011; 86:953–961.
2 National Institutes of Health. Award data for individual organizations. http://report.nih.gov/award/trends/FindOrg.cfm. Accessed December 13, 2011.
3 Ley TJ, Rosenberg LE. The physician–scientist career pipeline in 2005: Build it, and they will come. JAMA. 2005;294:1343–1351.
4 Rosenberg LE. MD/PhD programs—A call for an accounting. JAMA. 2008;300:1208–1209.

In Reply: We thank the authors for their insightful comments and suggestions for further inquiry regarding the predictive validity of our findings relating to career plans of MD–PhD students in U.S. medical schools. We agree that other institution-specific factors, beyond a particular medical school's status regarding Medical Scientist Training Program (MSTP) funding, may well contribute to the gender and racial/ethnic diversity of any single school's MD–PhD cohort. However, school-level data provided to us were limited to protect the identities of individual students and medical schools. Since we lacked institutional identifiers, we could not investigate the extent to which greater diversity among MD–PhD students in MSTP-funded schools was due to MSTP funding or to other school characteristics, but this question merits exploration. We obtained information about whether a medical school was in the top 40 institutions funded by the National Institutes of Health (NIH) during the matriculation years of our study population, but this variable was highly associated with MSTP-funding status: 94% of long-standing MSTP-funded, 42% of recent MSTP-funded, and 9% of non-MSTP-funded institutions were in the top 40 NIH-funded research institutions. Thus, we did not include the top 40 designation in our models to avoid overfitting the data.

We agree that the institutional environment likely plays an integral role in the development of physician–scientists. Institutional factors other than financial support of MD–PhD students (e.g., mentoring, research resources, other social and environmental characteristics of the institution) may well be influential in promoting students' development as physician–scientists. But the extent to which this may be true is an empirical question requiring further study.

Finally, in an earlier multiinstitutional study of six midwestern medical schools' graduates,[1] we reported the predictive validity of the career-intention item of the Association of American Medical Colleges (AAMC) Graduation Questionnaire on the outcome of full-time-faculty appointment using AAMC Faculty Roster data. The predictive validity of this career-intention item nationally among MD–PhD graduates, specifically, is the subject of ongoing research. Inclusion of career-intention information from the AAMC Matriculating Student Questionnaire could further our understanding of the role of the medical school environment in the evolution of the career paths of MD–PhD program enrollees.

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Reference

1 Andriole DA, Jeffe DB, Hageman H, et al. Variables associated with full-time faculty appointment among contemporary U.S. medical graduates: Implications for academic medicine workforce diversity. Acad Med. 2010; 85:1250–1257.