Editorial

Neurosurgical winners

RALPH G. DACEY JR., M.D., GREGORY J. ZIPPEL, M.D., AND DAVID D. LIMBRICK JR., M.D., PH.D.

Department of Neurological Surgery, Washington University School of Medicine in St. Louis, Missouri

Medical students and neurosurgical residents often ask us whether we think they should get an additional doctorate degree to enhance their neurosurgical careers. The answer to this question is obviously complicated and depends on many factors.

The paper by Choi and colleagues2 provides some important new information to address this question. They looked at 613 recent graduates of 10 neurosurgical training programs characterized by high h indexes. Twenty percent of the graduates had both medical (MD) and doctorate (PhD) degrees, and the proportion of graduates with this dual credential appeared to increase in recent years. About three-quarters of the MD-PhD graduates ended up in academic careers versus half of the MD-only group. The MD-PhD graduates were also more likely to have secured National Institutes of Health (NIH) funding. Surprisingly, however, although MD-PhD graduates were more successful in obtaining a first NIH grant, this advantage did not persist later in their grant-funding careers—a finding that could be significant depending on the nature of the first versus later grants. For example, if the first grant was a career development award (K series) and later grants were independent investigator awards (R series), the impact of a doctorate degree on ultimately achieving independent investigator status would seem to be somewhat lower than suggested in the present study. Finally, because the authors examined a select group of neurosurgical training programs with a particular academic bent, their results, as they acknowledge, may not be generalizable to all programs.

New and evolving stresses on academic neurosurgeons—including demands for clinical revenue to counter decreasing reimbursement, increasing emphasis on quality and performance metrics, and constricting federal budgets and NIH funding—are reducing the time that they have available for research. As a result, neurosurgical research productivity, in terms of both volume and quality, may diminish over time. However, many residency programs lack formalized instruction in research methodologies, and additional clinical training demands, such as unfurled fellowships, are expected to become commonplace within the traditional research years of residency. Thus, a decrease in the number of neurosurgeons interested and adequately trained in research may be imminent. One way to counter this trend is to recruit persons with MD-PhDs, who have already received significant research training, into neurosurgery.

From a research policy standpoint, it appears that investing in additional research training for neurosurgeons makes sense despite some controversy regarding the medical scientist training programs in general.1,3 The overwhelming majority of MD-PhD graduates from the programs studied by the authors chose to embark on academic careers. And the MD-PhDs were relatively successful in obtaining NIH funding—a sort of external validation of research quality. So we think that the question of whether PhD research training is of value for some neurosurgeons can clearly be answered yes. However, a more important question is “Given the interests and background of an individual neurosurgeon, what type of additional research training should be obtained to provide maximal reward for the individual and for the progress of our specialty?”

What matters most is that neurological trainees, during their residencies, accrue a set of tangible skills that will make them better scholars. For every neurosurgeon, the careful application of scholarship to neurological practice is one of the determinants of effectively contributing to the health of their patients and having a full, rewarding career. For many, this goal may be best achieved by obtaining the PhD degree. For others, it may involve training in engineering or materials science to enable a focus on innovation, technology, and neurological device design. Some may be best served by obtaining rigorous, formal training in clinical research and outcomes assessment in a Masters of Public Health or Masters of Clinical Research program. Residents who anticipate a career in community practice would also be well served by obtaining such skills because of the rapidly increasing importance of applying scientific techniques to issues of quality-of-care improvement.

A review of the history of our specialty indicates that progress and improved methods of caring for our patients have been the result, in many cases, of leveraging our relationships with other disciplines. Initially, the meticulous tissue handling principles developed by Halsted in breast and hernia repair surgery influenced Cushing as he developed techniques specific for neurosurgery. The application of laboratory science principles to clinical neurosur-
gery catapulted our specialty forward in the middle of the last century. Henry Schwartz and Sidney Goldring, working in the labs of neurophysiologists at Washington University, described the fundamentals of evoked potentials and their application to neurosurgical problems. Recent progress in expanded endoscopic skull base exposures and approaches developed as a result of our collaboration with colleagues in otolaryngology. The synergistic efforts of neurosurgeons and engineers have resulted in a great number of devices and processes that have improved neurosurgical care and patient outcomes at a dramatic pace in recent years.

In the future, there are at least three main ways in which interdisciplinary synergy will probably occur for the betterment of our specialty. First, neurosurgeons trained in basic laboratory science will continue to extend lines of investigation from other areas of biomedicine to neurosurgical problems. Many of these neurosurgeons will be dually trained with the MD and PhD degrees. Second, neurosurgeons who have obtained rigorous training in methods of clinical research will apply their expertise to neurosurgical problems and dramatically improve the evidence basis for our specialty. Third, neurosurgeons who have received additional training at the interface with engineering and device development will advance our treatment paradigms.

Individuals planning a neurosurgical career should consider the potential effect that PhD training will have on their personal career satisfaction. There are costs associated with obtaining the additional training, including financial costs, opportunity costs, and costs borne by the neurosurgeon’s family. For some neurosurgeons, the sacrifice of this additional rigorous scientific training will be great but worth the cost. To compete for NIH funding in the ever more competitive NIH environment, current and future neurosurgeons with basic science interests will need to be as skilled and capable as nonphysician basic scientists. For some, this will raise the value of obtaining MD and PhD degrees in medical school.

It is likely that in the future more tailored programs of research training will be devised to achieve the interdisciplinary leveraging described above. It is critical to our specialty that this cross-discipline fertilization continues. Future generations of neurosurgical patients will depend on it.

Disclosure

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References


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