EDITORIAL

Misrepresentation among neurosurgery residency applicants**Roberto C. Heros, MD**

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I WAS asked to write an editorial on the article by Dr. Kistka and her colleagues¹ in this issue of the *Journal of Neurosurgery*. For me, this is very timely, since we are in the middle of interviewing applicants for this year's match. Frankly, I am very surprised and, I must admit, disappointed by the findings. The authors studied all the applications for neurosurgery residency positions at Vanderbilt University in 2006 and in 2012 and, using identical methodology for both sets of applications, set out to identify incidents of publication misrepresentation and compared the incidence in these 2 years. They found that there was a significant increase in the number of applicants who had misrepresented one or more of their publications between these 2 years (33% vs 45%). They divided these "misrepresentations" into the following categories: work that did not exist at all; applicant listed as first author when in the original publication he was not; incorrect listing of the publication as being "peer-reviewed" when in fact it was not; and listing online-only publication in the incorrect section of the application (listing it in the "Peer Reviewed Journal Article/Abstracts" section rather than in the "Peer Reviewed Online Publication" section). Fortunately, this last form of misrepresentation was the most common. In my opinion, this would fall in a category of a lesser sin, and I would generously tend to give these individuals the benefit of the doubt and assume that perhaps they did not understand the difference in the sections. Most disturbingly, however, was the fact that the second most common category was to list articles and abstracts that did not exist at all and there were 57 of these misrepresentations in 2012. It is hard for me to classify these as anything but examples of intellectual dishonesty.

Who is to blame for this problem? Clearly, the fault falls squarely on the applicants' shoulders. It is important, however, to consider the root causes of such behavior. Un-

questionably, the most important factor is the competitiveness of obtaining a position as a neurosurgical resident in one of our programs. We should not apologize for this, and in fact should be very proud of it. We want to continue to attract the "best and brightest" medical students, and there is every indication that we still do. It appears that the competitiveness of our programs has increased rather than the opposite. As we consider applicants, do we place undue importance on the number of publications in the application? I suspect that this varies significantly between institutions and faculty members. Most of our programs, even those that predominantly graduate residents who do not follow an academic career in the future, would favor, under otherwise equal circumstances, applicants who have shown evidence of scholarly productivity. This has become increasingly important given the vagueness of the information we receive from deans' letters in terms of the class standing and grade point average of the residents. Additionally, the average of neurosurgical applicants' USMLE Step 1 scores, another factor that we tend to use to judge applicants, has become so high that unless they are extremely high or very low their discriminating value is minimal. Most of us also pay attention to "extracurricular activities," but nowadays it is difficult to find applicants who have not engaged in such activities in one form or another. Additionally, it is frequently impossible to guess whether the applicant who spent time building huts for the poor in Africa did so out of love for the poor and a true humanitarian spirit or whether he or she did it simply to strengthen applications to medical schools and/or residency programs. We also pay attention to the letters of recommendation but they are valuable only infrequently, when they say something like "the best student I have seen..." or, conversely, "this is a good student," which of course means the student is not good at all.

ACCOMPANYING ARTICLE See pp 193–198. DOI: 10.3171/2014.12.JNS141990.

INCLUDE WHEN CITING Published online July 24, 2015; DOI: 10.3171/2015.1.JNS142803.

DISCLOSURE The author reports no conflict of interest.

This article has made me reflect on other less obvious and certainly less damnable ways in which we encourage a subtle degree of intellectual dishonesty in publications. We frequently encourage our medical students, and certainly our residents, to publish “for the sake of publishing”—even on topics we know will not contribute in any significant way, other than by cluttering our lesser journals, to our body of knowledge. We frequently encourage them to write case reports that we know will lead to no useful diagnostic or therapeutic lessons. At times we encourage them to review our series of a few cases of this or that when we know that nothing of value will come of it, or to prepare publications by reviewing a topic that has been extensively reviewed or that will lead to conclusions that are perfectly predictable or possibly wrong. With the proliferation of scientific journals, frequently these “works” find their way to a printed page or an on-line publication. Is this a good use of the medical student’s or the resident’s time? In my opinion, the practice is even more reprehensible when the motivation is to have our name included in such publications in order to fatten our own CVs. At the risk of being “politically incorrect” and perhaps offending some of my colleagues, I feel compelled to comment on another very subtle form of relative intellectual dishonesty in publications, and that is the issue of the multi-authored publication. It is not uncommon nowadays to find publications with 5, 6, and sometimes 10 different authors. Unquestionably, there are situations in which this is justified, particularly when reporting complex experimental work that required collaboration (and work!) from several different individuals with different backgrounds and different expertise. However, does it require 6 authors to write a case report or a retrospective review of a clinical series? Does the fact that several of the individuals listed as authors participated in the care of some of the patients reviewed or simply work in the same group justify their inclusion as authors? How many of the authors did actually work on the design or execution of the published work? As I look back at my own CV, I find that the vast majority of my early publications were either single authored or perhaps written with the assistance of one resident. I suspect that this is also the case for most colleagues of my generation. Is the current trend towards multi-authored publications a healthy one or does this practice involve a subtle degree of intellectual dishonesty?

Returning to the specific topic of neurosurgical applicants, what are we to do about this issue of publication misrepresentation? Clearly, we should begin with the slow process of changing the culture and educating our medical students and our residents in the fact that, yes, evidence of scholastic activity including publications is important but what is important is the quality and impact of such publications and not the sheer numbers. An important part of that change in culture, and I do hate to realize that this apparently has not been as important a part of our culture as I would have hoped, is the understanding that intellectual dishonesty, in any form, will not be tolerated in our specialty and that this will include close scrutiny of applications for residency. Clearly, this change in culture will come slowly, and its impact may not be measurable, and we have to do something now. It will be very cumbersome

to review the accuracy of all the publications listed in the 250-plus applications that most of us get these days. What the article by Kistka and colleagues stimulates us to do is to have a greater degree of alertness toward the possibility of publication misrepresentation in these applications. From a practical point of view, as I review applications, I will pay more attention to the publication lists of those applicants whom I intend to select for interviews. Of particular importance is to pay close attention to those applicants whom we are selecting for interviews precisely because of their list of publications. I believe that those of us that have been around for a while can “smell” the likelihood of misrepresentation, and it is easy enough to have one of our assistants check into a specific situation very quickly. Certainly, when developing our ranking list, we should check carefully the publication lists of those applicants to whom we are giving considerable priority precisely because of their publication record. It is my feeling that even the finding of one significant misrepresentation, such as listing a publication that does not exist, is enough to remove that applicant from the ranking list. We have enough good applicants that we do not have to take a risk of having a potentially dishonest resident, which is perhaps the most dreaded mistake we can make in our selection process.

I will end by stating that I find no consolation in the fact that, as well discussed by Dr. Kistka and her colleagues, this problem is not unique to neurosurgery and has been documented in several other specialties. Whether this problem is more prevalent in such a competitive specialty as neurosurgery or not is as yet not clear from the data available, but, frankly, it doesn’t matter. Neurosurgeons are special, and we must demand more of ourselves. There should be zero tolerance for clear-cut intellectual dishonesty in our specialty. We are grateful to the authors of this study for pointing out to us that we have some work to do.

<http://thejns.org/doi/abs/10.3171/2015.1.JNS142803>

Reference

1. Kistka HM, Nayeri A, Wang L, Dow J, Chandrasekhar R, Chambless LB: Publication misrepresentation among neurosurgery residency applicants: an increasing problem. *J Neurosurg* [epub ahead of print July 24, 2015. DOI: 10.3171/2014.12.JNS141990]

Response

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We thank Dr. Heros for his insightful editorial and appreciate his perspective on this challenging subject. We agree that, for many neurosurgical programs, there is now an expectation of significant scientific productivity among residency applicants, and we feel that the increasing rate of misrepresentations we have identified reflects the pressure of that expectation. In our opinion, there are two distinct driving forces behind this change.

First, as Dr. Heros clearly outlined, application reviewers are faced with the challenge of selecting applicants from an apparently homogeneous pool. Students apply to our programs with generally outstanding grades, scores, and letters of recommendation. Discriminating between subtle features within these categories is challenging. As a result, scientific productivity, often in terms of sheer numbers of publications, can be seen as an easy proxy of academic achievement and can be used to guide interview offers or ranking. Our field would benefit from the development of a better metric to judge candidates' overall preparedness for neurosurgical residency.

Second, we agree that there is a culture in some corners of neurosurgery that promotes publication for its own sake. This may result in the proliferation of low-quality papers and accelerate feelings of competition between colleagues, and competition can beget desperation. It is clear

that this may lead students to behave in an unethical way, for which they bear ultimate responsibility. However, we also feel that scientific mentors may have a strong influence on this behavior. During our analysis of this project, we had the opportunity to investigate some of the misrepresentations we identified. In several examples, we were able to confirm that students were instructed by neurosurgical mentors (both faculty and residents) to document their scientific work erroneously to improve their chances in the match. Sadly, the issue we have studied in this project pertains to more than just misguided medical students.

To put it simply, culture comes from the top. Students must see neurosurgeons employing rigorous scientific ethics in our own work. Promoting and enforcing these principles will only benefit the neurosurgical community and it is our hope that this article can be a contribution to this effort.