

Authorship: Rite, Right, or Write of Passage?

After examining more than 1000 submitted manuscripts as editor, I took a few moments recently to step back from the day-to-day editorial process and look at the first 12 issues published during my tenure. Initially, I thought each Table of Contents caught my attention because of the revised format of having all original articles grouped under 2 headings: Clinical Investigations and Basic Science Investigations. However, I soon realized that my eyes tended to zero in on the lines of italicized type—usually 1–3 per article but occasionally up to 4. Subconsciously, I was noting the number of authors for each published article. I knew that, in the last year, we had been enforcing a limit of 10 authors per accepted manuscript, but I had assumed that the average number of authors would be less than half that number. Since it turned out, in fact, to be 7, I then looked at previous year averages. Although the articles during 1996 had an average of only 6 authors, that number increased to 7 the next year and has remained at that level ever since (similar to author levels in another nuclear medicine journal during that time period). Before enforcement of the limit on authors, an occasional article would have more than a dozen authors, with the highest total being 17. Since a survey of journals in the field of radiology found an average of approximately 2 authors per manuscript in 1966 and only twice that in 1991 (1), it shocked me to think that we are perilously close to doubling that increase in less than 10 y!

Of course, there is no ideal number of authors for any given manuscript; however, it is important to examine why the average has more than tripled in the past 35 y. A 20-y study of articles in the *British Medical Journal* noted a considerable increase in senior researchers (including professors and chairper-

sons) in the list of authors (2). While individuals in this group have increasingly become first authors, the position of last author continues to be taken by the senior member of the research team (3). In between these 2 (and still, quite frequently, as first author) are junior members of the faculty, who are motivated by the need to publish to advance academically. Because these individuals receive tenure or promotion based on grant support and scientific publications, institutional promotion committees should more diligently evaluate originality, scientific content, and each article's true contribution in an effort to distinguish quality from quantity of published articles (4). (Perhaps the citation index of the journal in which each article appears could be used in this endeavor.) The tendency at some institutions to base tenure or promotions on mere numbers has contributed to the inflation rate of number of authors per manuscript. The almost-arbitrary addition of names, regardless of their degree of effort, to a manuscript has become fairly commonplace because it is seen as a win-win situation. The individual(s) in that department and other areas of the medical center who are included as authors are 1 step closer to their goal of promotion, with the inclusion of authors from other departments having the added benefit of boosting interdepartment goodwill. Senior members of the faculty or departmental chairs are able to publicly display a greater breadth of expertise on the basis of the widened array of publications listed in their curriculum vitae. Often, visiting scholars are given the opportunity to receive tangible proof of the work they performed at the host institution.

All of these rewards of authorship are perfectly legitimate—if the individuals have actually made significant contributions in the design of the study, drafting of the manuscript, and the

process of fine-tuning and, ultimately, revising the manuscript based on the reviewers' and editor's comments. Often, however, the increase in the number of authors is attributed to such phenomena as the intricacies of biomedical research, which "justify" adding the names of individuals from various laboratories and departments in the medical center. However, this correlation between increased staffing and escalating authorship has yet to be proven (5).

So what is the down side to this ever-increasing tendency to put more and more names of authors on submitted manuscripts? Who can possibly lose in such a win-win environment? The answer to the latter question is pretty much everybody when the advancement of scientific knowledge takes a backseat to the political maneuvering in academic settings. Too often, the desire to further a career or gain favor takes precedence over effectively sharing advances in clinical practice and research, which should be the steadfast goal of every article (5), hence why *The Journal of Nuclear Medicine* has a limit of 10 authors per manuscript. That ceiling is set at what should be a rarely used maximum; however, I continue to receive submissions with lists of authors extending into the teens.

Perhaps this trend cannot be reversed, but there are some measures that may help preserve the integrity of each manuscript. From this time forward, a paraphrased version of the following excerpt from the *Uniform Requirements for Manuscripts Submitted to Biomedical Journals* (6) will be added to the copyright disclosure statement required in cover letters for submissions to *The Journal of Nuclear Medicine*:

"Authorship credit should be based only on substantial contributions to 1) conception and design, or analysis and interpretation of data; and to 2) drafting

the article or revising it critically for important intellectual content; and on 3) final approval of the version to be published. Conditions 1, 2, and 3 must all be met.

... Persons who have contributed intellectually to the paper but whose contributions do not justify authorship may be named and their function or contribution described—for example, 'scientific adviser,' 'critical review of study proposal,' 'data collection,' or 'participation in clinical trial.' Such persons must have given their permission to be named."

The latter names would go into the Acknowledgment section of the article. It is hoped that further elucidation of exactly who should and should not be considered an author will help preserve the integrity of authorship.

Just as the corresponding author or, in some instances, the first author should take responsibility for the list of those who contributed significantly to the manuscript, someone must also conscientiously attend to the list of references. Along with the study's data and conclusions based thereon, the published pieces cited throughout the text are part of the backbone of the article's integrity, which is precisely why the *Journal* places limits on the number of reference citations in submitted manuscripts. It is the duty of the authors to base the background elements of the paper on the most pertinent (and, often but not always, the most recent) studies

in the literature. Also, the list of references is a guide to readers who are interested in further study in that particular topic. However, an encyclopedic and often redundant listing of the literature lessens the impact of the cited publications that succinctly prove the article's point and can discourage readers from investigating a selection of the cited references. If the work cannot be substantiated by a maximum of 40 references for original manuscripts and 5 references for brief communications and letters to the editor, then the intent of the paper should be re-evaluated. Because continuing education articles and special contributions are meant to have a broader scope, the number of references in these manuscripts is higher and is accommodated accordingly.

Again, there must be 1 individual who oversees the decisions in regard to the final list of references cited. Although it does not matter who that person is, the natural choice is often the corresponding author, because editorial queries during the production process are listed on galley proofs and are addressed to him or her. The simple fact is that someone must make those decisions, preferably before submission, rather than during revision or production. This reference controller should: (a) hold the reigns on excessive simultaneous citations (e.g., listing one-third or more of the references at the same point in the manuscript); (b) keep citation of publications by any

of the manuscript's authors to a bare minimum, thereby broadening the base of support for the article's findings; (c) avoid the inclusion of abstracts in the reference list (6), because it is preferable to cite either the subsequent full article by those authors or, in cases in which abstracts do not lead to a full published manuscript, a different study in that area; and (d) verify each cited reference against the original documents (6).

All of these suggestions might, indeed, make more work for each individual who wants his or her name on the title page as an author of a manuscript, and that is the way it should be. The rituals of research and writing are painstakingly difficult, but the rewards are universally seen as being worth the effort.

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