

SPECIAL ARTICLES

Equity, Accountability, Transparency: Implementation of the Contributorship Concept in a Multi-site Study

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The recent explosion in the conduct of multi-site and multinational research has created complexities in the assignment of authorship that challenge investigators who publish the results of their research. The practice of using “guest” and “ghost” authors is common. These issues of complexity and inequity received international attention in 1997 when, in order to ensure equity, accountability, and transparency of authorship, the concept of assigning contributors and guarantors was first proposed by Rennie and colleagues.¹ The concept has since been embraced by leading medical journals.

Because of expanding opportunities within the profession of pharmacy, issues of authorship will become commonplace. Yet many pharmacists receive no formal education about issues inherent in this aspect of the publication process. From 1998-2000, the Department of Pharmacy at our institution conducted a multi-site randomized trial. The primary investigators were committed to ensuring that all investigators were appropriately recognized for their contributions and adopted the concept of contributorship to ensure this equity as one of our outcomes. By application of the contributorship concept, and through a formal and systematic process, we arrived at an equitable assignment of authorship for our resulting publication. We describe our experience in the following case study.

Keywords: authorship, contributorship, publishing, byline

INTRODUCTION

The issue of assigning authorship in biomedical publications has grown increasingly complex in recent years. This complexity reflects several factors, one of which is the explosion of medical research and the necessity for collaboration among investigators from multiple sites and numerous disciplines. This trend has led to an increase in the number of authors over the past several decades – from 1.3 authors per manuscript in 1930 to over 4 authors per manuscript in 1994.^{2,3} Two additional and often accepted practices that have also contributed to an increased number of authors are the use of “guest” authors (those who are so honored by the nature of their position), and “ghost” authors (those who write, but whose name is not used). In their study of these practices, Flanagan and colleagues found guest authorship present in 19% of articles they reviewed; ghost authorship in 11%; and both honorary and ghost authorship present in 2%.⁴ Separately, The Cochrane

Collaboration explored the use of guest and ghost authors in their own context and found that of 141 reviews, 39% had evidence of guest authors, 9% of ghost authors, and 2% of both.⁵

To address these and other publication issues, the International Committee of Medical Journal Editors (ICMJE) published, and periodically updates guidelines for the manuscript format of biomedical publications (referred to as the “Uniform Requirements”).⁶ These guidelines were initially quite strict and were therefore not readily embraced.⁷ They stated that, “authorship credit should be based on (1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content; and (3) final approval of the version to be published. Authors should meet conditions 1, 2, and 3”.⁶ In 1997, Rennie and colleagues proposed a consensus approach to defining author contributions in which a relative value would be assigned to each contribution. This method provided a mechanism for identifying authors and an explanation and justification for ordering names in a byline. They suggested that contributions be described at

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the end of the manuscript, and that one or more guarantors be responsible for the entire work.¹ The Uniform Requirements have now been revised to include these newer concepts.⁷

At some time in our professional lives, many of us will experience the discomfort that stems from the lack of clarity about plans for formal recognition (ie, authorship) of individual roles on a project. Yet aspects of our professional education that relate to publication issues, specifically authorship, are not often formally addressed. A few papers have described the implementation of the contributorship concept, but none in the setting of a school of pharmacy.⁸⁻¹² In this paper, we describe our application of the contributorship concept.

Case Study Setting

From 1998-1999 the Department of Clinical Pharmacy at the University of California San Francisco hosted a post-doctoral fellow (JB) who identified among his goals the conduct of a study with the goal of demonstrating that the impact of a healthcare intervention provided by a pharmacist could improve patient outcomes. Two faculty members (EBD, LAB) joined the fellow to ensure the success of what became a study supported at all levels of pharmacy administration. We designed and conducted a randomized, controlled, multi-site study investigating the impact of a post-discharge telephone intervention on the quality of life of solid tumor oncology patients.¹³ Our research spanned 4 practice sites and involved 17 investigators. To ensure equity, accountability, and transparency of authorship, we developed a numeric scoring method to apply the concept of contributorship and guarantorship proposed by Rennie and colleagues.

METHODS

Our initial approach to authorship was to adhere strictly to the guidelines of the ICMJE, using the criteria outlined in the January 1997 version of the Uniform Requirements.¹⁴ Using these criteria, only the 3 primary investigators qualified as authors (EBD, JB, and LAB). Shortly after commencement of data collection we participated in a poster session designed to share scholarly work being conducted within our department. At that time we presented our methods and the preliminary results of the first few subjects enrolled. Despite acknowledgment of their contributions, a few of our colleagues who had assisted with study design and data collection expressed their concern about not being listed as poster authors.

We immediately recognized our colleagues' concern, revised our authorship strategy, and introduced the con-

cept of contributorship and guarantorship to the other investigators. These individuals ranged in rank from senior faculty members to residents; their disciplines varied from administrators to clinicians, from a policy analyst to a statistician. Their contributions ranged from ongoing participation in study design and data collection to screening patients for inclusion in/exclusion from the study, to providing follow-up telephone calls reminding subjects to return their survey forms to the investigators.

We polled these colleagues and found many were unfamiliar with the contributorship concept. We planned a meeting and invited all those participating in the study. In advance, each participant was given background readings and a summary of the literature prepared by JB.^{6,7,14-17} Those unable to attend were invited to send a representative.

During the meeting we discussed adoption of the concept of contributorship for our study. An informal consensus approach was used. Using a chalkboard, we brainstormed identification of, and listed all known and foreseeable tasks to be completed during the study and its publication. We next divided the list of tasks into those that would qualify as authors to be listed in the byline versus those that would qualify for acknowledgments. We then ranked each task according to the level of importance to the study. Finally, we developed a weighting schema for level of participation. Throughout the process we talked through each step until verbal consensus was reached among all those in attendance. At each juncture, each person in attendance was offered a chance to state his or her opinion.

Meeting participants also agreed that the investigator writing the first draft would be the first author listed in the byline, and that subsequent byline order would be assigned according to the scoring schema created for this purpose. We did not set a threshold level that qualified for authorship. Instead we agreed that all who had been involved in a task that was listed in the category of "Contributorship in the Byline" were eligible for authorship; those not qualifying would be included in the "Acknowledgment" statement at the end of the study. All agreed that the three investigators leading the study would serve as guarantors, taking responsibility for overall project completion and for publication.

The listing and weighting schema were used to create a "contributorship worksheet" that was subsequently completed by each investigator shortly after the meeting. Employing the concept of self-assessment, each investigator documented their contributions to date, as well as their intended, future involvement. Contributions were either assumed voluntarily (eg, participating in study

Table 1. Contributorship Worksheet

Contributorship Item for Byline = Authorship (in order of occurrence)	Level of Importance		Level of Participation		Score
	3=high 2=moderate 1=low	Participation Some=1 None=0	High=2 Low =1		
(1) Conceiving the idea for the project*	1	x	x	=	
(2) Conducting literature searches	2	x	x	=	
(3) Participating in study design (attending meetings)	1	x	x	=	
(4) Developing & refining study design	3	x	x	=	
(5) Designing the database	3	x	x	=	
(6) Collecting data & providing Call-Back	3	x	x	=	
(7) Developing analyses plans	3	x	x	=	
(8) Writing first draft†	3	x	x	=	
(9) Reviewing & commenting on first draft*	1	x	x	=	
(10) Revising first draft & finalizing publication	3	x	x	=	
(11) Coordinating & managing project operations & progress	3	x	x	x	
(12) Responding to peer reviewer comments	2	x	x	=	
(13) Answering letters to the editor	2	x	x	=	
Acknowledged (not scored)	0	x	x	=	
(14) Obtaining funding					Not scored
(15) Collecting data to determine inclusion in/exclusion from the study					Not scored
(16) Providing telephone reminders					Not scored
(17) Entering data into database					Not scored
(18) Analyzing data					Not scored
	Total	=			

*Does not qualify for authorship if only contribution

†First in byline

Table 2. Contributorship Worksheet Scores

Investigator/Participant	Intended Contributor Recognition	Score
JB	First in byline	39
EBD	Second in byline	24
LAB	Third in byline	20
VC	Fourth in byline	13
RJI	Fifth in byline	12
LM	Sixth in byline	10
MS	Seventh in byline	10
AM	Eighth in byline	6
Nine others	Acknowledged	Not scored

design), or were assigned as part of the routine course of the individual's job description (eg, collecting data and contacting patients by telephone). This exercise served to solidify commitment to the project; accountability for stated contributions, and transparency for all involved. We agreed that only the version of the worksheet that was completed at study end would be scored and ulti-

mately used to determine qualifications for authorship, and the order of names in the byline.

RESULTS

The investigators adopted the contributorship concept and the proposed method for evaluating tasks. The resulting contributorship worksheet appears in Table 1. The list of identified and categorized tasks is provided, in order of their occurrence in the study. The investigators assigned a level of importance to each task to be completed during the study: 3=high, 2=moderate, 1=low. Creation of the weighting schema for level of participation involved a 2-step process: (1) assigning a "1" if an investigator contributed in a given category and "0" if they did not, and (2) assigning a "2" if an investigator felt his or her contribution was high, and a "1" if low. The highest possible contributorship score was 60 points. The actual scores on the final worksheet ranged from 6 to 39 points. Based on the contributorship worksheet scores, 8 contributors were listed as authors in the byline, 3 of whom served as guarantors (EBD, JB, LAB). Nine additional investigators were acknowledged (Table 2).

Post-study feedback, informally gathered from the investigators, revealed the method worked well. All agreed it clarified the order of the byline and averted potential disagreements concerning authorship. At the time of publication to our selected journal⁹ we submitted the Contributorship Statement, specifying the contributions of each author (Appendix 1).

DISCUSSION

Ours is one of the few descriptions detailing a method for assigning authorship and order in a byline that has been published,⁸⁻¹² and the only one of which we are aware that takes place in the setting of a school of pharmacy. Using a numeric scoring method and a largely prospective approach, we achieved consensus concerning contributorship. The method clearly established that individual efforts would be equitably rewarded. Completion of the pre-study contributorship worksheet enabled each investigator to plan their workload and to anticipate their accountability. Submitting our Contributorship Statement to the journal editor verified the legitimacy of our byline.

Several limitations are apparent in our process for assigning authorship. First, our method for assigning authorship was created after our study was initiated. Ideally, this process is best undertaken prior to study launch, at the time of design and development, thus ensuring equity, accountability, and transparency for those involved. Secondly, although the tasks included in the authorship section versus the acknowledgment section of Table 1 may seem arbitrary to the reader of this report, they were categorized accordingly for reasons specific to our study. Number 14 (obtaining funding) and Number 18 (analyzing data) were placed in the acknowledgment section at the request of those completing these 2 tasks. Our senior faculty members and administrators arranged for all funding. To give investigators more directly involved in the study the opportunity for recognition, they graciously requested their names not be included in the byline. Similarly, the statistician completing our data analysis offered to forego his authorship role. We declined his offer and retained him as an author, as his contributions were significant. Number 15 (collecting data to determine eligibility) was a simple task completed by all pharmacists practicing in the involved oncology services and did not constitute a significant workload. Number 16 (providing telephone reminders) and number 17 (entering data into database) were tasks conducted by our administrative staff members. Finally, we did not include any peer review in our process for assigning authorship. Including this, and a mechanism

for reconciliation of differences, would confer validity to our processes and scoring schema.

Despite these limitations, the process of assigning contributorship was considered a success by our investigators. Although we requested publication of the Contributorship Statement by the journal to which we submitted our manuscript, ultimately only our Acknowledgment Statement was published.¹³ Even so, each of us has continued to use our method of determining authorship at our respective institutions.

Several leading medical journals have now embraced the contributorship concept.¹⁵⁻²² The most recent update of the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (October 2004) includes the concept of contributor and guarantor, and encourages both describing the contributions of investigators and the team approach to decision-making.⁶ Also, it now suggests a category of "clinical investigators" or "participating investigators" for those not qualifying as authors.

As the profession of pharmacy advances, our graduates and practitioners will have expanded opportunities to participate in research and publication activities. Indeed, opportunities already abound for pharmacists to participate on research teams. These opportunities are not limited to those practicing in the academic setting. Pharmacists employed in industry and in the managed care and community practice settings are likely to be involved in some aspects of research. Pharmacists employed in the field of medical publication will likely address the issue of guest and ghost authorship. Participation should result in recognition and reward, often in the form of authorship on resulting publications. Yet, discussions of equity in authorship are not frequently addressed in a proactive and overt fashion. We describe one method for so doing—a method that has the potential for fostering collaboration and accountability, while promoting equitable recognition—all leading to increased professionalism.

We share our case study not to suggest ours is the definitive categorization and scoring mechanism in determining authorship, but to share one potential mechanism that may be adopted by others, and adapted to their particular circumstances. We feel any method that promotes collaboration among participants, while adhering to standards of equity, accountability, and transparency constitutes advancement in the field.

CONCLUSIONS

The ICMJE has agreed that the reward system for assigning authorship in publications deserves discussion and improvement. Recent editions of the *Uniform*

Requirements have begun to address the issue.⁶ Contributorship is gaining momentum as a way to ensure equity, accountability, and transparency in authorship. The field is still evolving. Our investigators were pleased to be part of the evolution and we hope the contributorship concept gains more widespread acceptance over time.

Contributorship Statement

E.B. Devine conducted literature searches, participated in data collection and analysis of the contributorship worksheets, drafted and critically revised the manuscript, and provided administrative support and supervision. J. Beney conducted literature searches and wrote literature summaries, participated in data collection and analysis of the contributorship worksheets, critically evaluated the manuscript, and provided administrative and technical support. L.A. Bero was responsible for conception and design, critical revision of the manuscript and the provision of material support and supervision.

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Appendix 1. Example of a Contributorship Statement⁹

JB conducted literature searches, participated in the study design, analysis plan and statistical analyses. He designed the database, participated in the coordination and management of the project and wrote the first draft. EBD participated in the study design and analysis plan, in the coordination and management of the project and in writing.. She conceived of the idea for the project. LAB participated in the study design and analysis plan, and in the design of the database. She conceived of the idea for the project and edited the manuscript. VC participated in the study design, the data collection, provision of the call back, and in editing the manuscript. She conceived of the idea for the call back. RJI participated in the study design, the data collection and provision of the call back and in editing the manuscript. LM and MS participated in data collection and provision of the call back, in coordination and management of the project, and in reviewing the manuscript. AM participated in the analysis plan, conducted the statistical analyses and reviewed the manuscript