The Training of Physician-Editors: A Call for a More Formal Approach

Victoria S S Wong

One of the primary roles of a medical editor (defined here as a physician responsible for the scientific content of a medical journal) is to improve a journal's quality by "becoming familiar with the best practice in editing, peer review, research ethics, methods of investigation, and the rationale and evidence base supporting them".[1] To my knowledge, however, there are no formal training programs whereby medical editors can acquire that skill set. And there does not appear to be a certification program or degree that would allow a physician to train specifically to become a medical editor.[2] The World Association of Medical Editors (WAME) has recognized the need for "training newcomers to the field"[3] and provides a number of educational resources,[4] but these resources alone are not sufficient for the prospective medical editor to learn the hands-on skills of medical editing.

Meanwhile, the steady increase in the amount of biomedical research performed suggests a greater need for medical editors. The number of journals indexed in MEDLINE has increased by nearly 100 titles a year, while the number of journal citations has increased by more than 15,000 a year since 2003.[5] The number of submissions to major biomedical journals is also on the rise.[6] The rapid growth in the numbers of submissions and publications requires a greater number of physicians to evaluate the validity and relevance of manuscript submissions to sustain a high-quality body of medical literature. The question is, Where will these physicians come from?

VICTORIA S S WONG, *who completed a medical-editing elective at* JAMA *while a medical student, is now a University of Washington medical intern at the Boise Veterans Affairs Medical Center.*

Current Status of Training

Medical editors enter the field from a wide variety of experiences,[2] but their demographics and training backgrounds have not been well documented. Garrow et al reported some demographics specifically of editors in chief, noting that 30% of them had entered their position by election by scientific societies or colleges, 25% had been recommended by their predecessors, and 18% had interviewed for the positions after advertisement.[7] But their experience before their editing positions was not documented, and no data were collected on nonchief medical editors. One journal addressed where its own medical editors came from, stating that "physician editors learn the trade through apprenticeship with other physician editors, often through the editor's medical editing clerkship and fellowship programs."[8] Such clerkship and fellowship programs are the only types of training programs in place that allow aspiring physician-editors to receive on-the-job training. However, there are some classes for training those who desire skills in medical editing. One example is the curriculum of short courses offered by the Council of Science Editors[9]; these courses are offered annually to address topics of central importance to science editors. Such classes alone, however, will not encompass the entire scope of medical editing, nor do they provide the opportunity to apply the skills learned to real examples as fellowship programs do.

A Google search for current opportunities for fellowships in medical editing using combinations of the terms *medical*, *editing*, *editor*, *physician*, and *fellowship* revealed six medical-editing fellowships that have a medical degree as a prerequisite. The fellowships are sponsored by *JAMA*,[10] the *New England Journal of Medicine* (*NEJM*),[11] the *Canadian Medical Association Journal* (*CMAJ*),[12] *American Family Physician* (*AFP*),[13] *Annals of Emergency Medicine* (*AEM*),[14] and the Radiological Society of North America (RSNA).[15] It should be noted that a Google search of this nature would tend to exclude training programs that are not called fellowships and programs in countries where English is not the predominant language.

The fellowship programs at *JAMA*, *NEJM*, *CMAJ*, and *AFP* have similar descriptions. They are all 1-year programs established to train physicians who are interested in medical writing, editing, and publishing. The *AFP* program gives priority to physicians who have completed a family-practice residency, but some others are open to physicians in any field. Fellows participate in all aspects of journal production, focusing on screening manuscripts and participating in the peer-review and revision processes and generally functioning as medical editors. They are also encouraged to pick up independent projects related to the journal and to do some medical writing.[10-13] The *AEM* fellowship is unique in that it is a part-time program aimed at residents who are in training in emergency-medicine residency programs.[14] The RSNA fellowship is geared specifically to radiologists who have 3 to 5 years of experience at the attending-physician level and is a month-long program.[15] The programs also provide exposure to the entire journal publication process with a focus on evaluating, tracking, and revising manuscripts.

In addition, *JAMA*, *AFP*, and the *British Medical Journal* (*BMJ*) have created 1- to 2-month electives for medical students to undergo a similar training experience. The *JAMA*[16] and *AFP*[17] electives are geared to medical students in their last year of medical school; *BMJ* accepts students at any stage of their medical training.[18]

Necessity for Evaluation of Current Training

Because of the scarcity of published data on the aforementioned training programs, it is difficult to judge their success in teaching medical-editing skills to physicians and in recruiting physicians to become medical editors. One article about *JAMA*'s Fishbein Fellowship noted that of the 23 people who had held the fellowship, more than half ended up devoting some part of their career to medical publishing or communication.[10] Another article noted that most of the family physicians who completed the *AFP* fellowship still work for *AFP* "in various editing capacities".[19] The majority of the literature about these programs, however, consists of personal narratives by physicians who have completed the fellowships and written about their experiences.

The subjective experiences of those who have completed medical-editing fellowships are largely favorable. Although the reviews are probably biased, given that they are typically published in the journals at which the fellows had worked, they offer some insight into the value of the fellowships. One *AFP* fellowship alumnus stated that the fellowship made him a better clinician in addition to a better teacher and editor.[20] A *CMAJ* fellow said that his experience resulted in "satisfaction in helping to disseminate useful information that both reflects and helps to shape important trends in clinical practice".[12] More objective data on the efficacy of the training programs clearly are needed so that the current programs can be fine-tuned and a practical structure for the creation of future training programs can be formed.

Katz et al published an editorial with the views of seven persons who completed the RNSA editorial fellowship.[21] The editorial noted the lack of publications about "the purpose, value, and experience gained from a medical journalism fellowship". On the basis of their joint experiences, they emphasized the importance of ethical issues in medical journalism and the necessity of an apprenticeship component to take in the "numerous skill sets" that go into producing a medical journal. Although they offered no quantitative data, they noted that "many" of the seven joined the editorial boards of major radiology journals after their fellowship experience, and all felt comfortable in carrying out editorial tasks.

Rationale for Greater Formalization

It is important to know how editorial tasks are being taught in the training programs. Only with standardization of the teaching can we hope to have intra-rater reliability (referring to medical editors on a given journal's staff) and interrater reliability (among journals) regarding the rejection and acceptance of manuscripts for publication. That choice, despite the variability in peer-reviewer input, should not vary greatly among medical editors for any given manuscript. The goal in training medical editors should be to develop in them a sense of the qualifications of a medical manuscript for publication and the appropriateness of its content, which would vary by journal; of the technical precision of research methods and statistical analysis; and of the quality of the writing. Through study of the current inter-rater and intra-rater reliability among medical editors, a baseline could be created and deficits in the current system could be determined.

With the current need for more physician-editors and the lack of a direct training system for physicians to enter the field of medical editing, research on training programs needs to be done so that the quality of the expanding body of medical literature can be upheld and, ideally, improved. The current training programs, scarce as they are, seem to exist primarily in the United States, Canada, and the United Kingdom, but the growth in the medical literature is not confined to these countries. In addition, the strong presence of the Internet is bringing forth a number of online-only medical journals, which will also add to the medical literature. All new research should undergo the same editorial process; the credibility of the published articles will continue to depend on the ability of medical editors.

Ideas to Improve and Formalize Training

One possible solution for the recruitment of additional medical editors would be to initiate exposure to medical journalism at an earlier stage of training, for example, by increasing medical students' opportunities for medical editing. Some premedical and medical students form an interest in medical journalism early and seek opportunities to work on the staff of a scientific journal, but this is hardly the norm. Many students, including me, focus on learning from textbooks and do not recognize the important role of medical journals in clinical practice until the time of clinical training. Introducing medical journalism earlier would promote interest and provide a population of younger physicians who are prepared to take on the task of sorting out high-quality research from the rest. An additional benefit of the training would be the creation of a population that is appropriately trained for peer review.

Another possibility, stemming from the success of current fellowship programs, would be to increase the number of fellows at the journals that have the appropriate resources to sponsor such fellowships. Smaller, low-impact journals with fewer resources could recruit locally to pique the interest of medical trainees, such as students and residents. Such efforts ideally would lead to a higher volume of medical-editing trainees, which would allow more efficient formal teaching. As with medical training and its combination of preclinical lectures and clinical on-the-job education, a medical-editing training program should provide both formal teaching on relevant topics and hands-on opportunities to edit manuscripts and participate in manuscript decisions.

A training program should address all topics that arise in the daily practice of a medical editor—namely, those mentioned in the introduction in the definition of the role of a medical editor. Those aspiring to enter the field should be educated in the larger scope of how a medical journal is put together and in the different roles of the staff of a medical journal, as well as in

Training continued

the basics of medical editing, the role of the peer reviewer, ethics in research and publication, appropriate research methods, and appropriate statistical analysis. They should also know how to use research databases, such as PubMed. Some regard should be given to basic copyediting principles. An aspiring medical editor should also read as many manuscripts as possible in their different stages—from submission, through the editing process, to acceptance and their final published form.

As the training programs become more developed, other decisions will need to be made, such as decisions about the duration of the training programs, whether they should be mandatory for all incoming medical editors, and how proficiency in medical-editing skills will be measured. Those decisions can initially be made by the programs themselves, but ideally an oversight committee would be created to standardize training programs. People in the field of medical editing should take the initiative to create such a committee. Alternatively, some organizations already in place, such as WAME and CSE, play a role in educating medical editors; they may choose to pursue this further to set priorities in this education.

In discussing the creation of new training programs, characterizing the training of the physicians who now make editorial decisions should also have high priority. The medical literature dictates clinical-practice guidelines and, similarly, we should identify the qualifications of current medical editors and provide them with additional medical-editing training as necessary. In a 1998 study surveying editors-in-chief of specialist clinical medical journals, 45% of respondents had no formal training in editing skills.[7] Of those respondents, 62% thought that some training would be valuable. Data of that type on nonchief physician-editors could not be found. By determining the type of training that these editors have received and what sort of training they would deem valuable, we can improve the training of current editors and create relevant training programs for those entering the field.

The improvement and formalization of training in medical journalism will require the leadership of current medical editors and input from the medical community as a whole. We need to produce a new generation of medical editors who are knowledgeable about all the facets of medical journalism, from ethics to evidence-based medicine. The scope of current biomedical research is vast, and changes in medicine will happen rapidly. To ensure that the changes are in an appropriate direction, the research behind them has to be sound. Priorities must be set in medical journalism. It is essential that current and incoming medical editors be properly trained to evaluate research with a critical eye.

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