

## Science editing for medical journals: two perspectives

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**Abstract** We examine several current issues of relevance to science editing for medical journals. We do so from the perspective of a former journal editor and from that of a current user, a physician responsible for training students to read critically. As Canadians, we bring a North American perspective to the discussion. Within this context, this paper addresses three topics that are likely to be viewed differently from our respective backgrounds. They are open access, peer review, and the role of publications in the context of knowledge transfer and the implementation of research findings. We believe these elements are interwoven and that the first two determine how well findings are implemented. This is equally true for clinicians as it is for researchers, and these relationships also appear to apply internationally.

**Keywords** Open access; peer review; knowledge transfer; clinical applications

### **Charles Pless, clinician teacher, writes:**

My view is that of a typical clinical consumer of the medical literature. I work as a primary care physician at a university-affiliated clinic and in an emergency department. As well, I regularly supervise medical students and residents, and this involves journal clubs and case discussions. Our students have some training in epidemiology and biostatistics during their preclinical years, and during their residency they use computer-based modules to enable them to critically appraise medical articles. But it is the rare student who has a genuine interest in critiquing what appears in medical journals.

Part of the reason for this lack of interest relates to the fact that most of my own and my students' use of the literature is patient-driven. A patient has a particular problem and we search for an answer. Rarely will students search print

journals; instead they head to the computer. The first destination is often the online textbook "UptoDate".<sup>1</sup> This is popular because it is easy to use, reliable, and has a solid reputation. For more in-depth research a Medline search may be conducted. Cochrane reviews are also popular, as are collections of guidelines.

What most of these have in common is that they are secondary sources; someone else has done the work of digesting the primary articles and judging their validity. They have synthesized a bottom-line answer to the basic question: "what should I do with this patient?" Where this opinion came from (and how) is rarely of interest to the busy medical student and future busy physician. That said, I assume authors of texts like UptoDate rely heavily on papers in well reviewed, highly reputable journals.

Occasionally, students are asked to choose a paper to present at a journal club or for a research project and will then have to evaluate it critically. I usually encourage students to choose from among well-known peer-reviewed frontline journals, explaining that a researcher with a good study will generally prefer to publish in the "best" journal. But more and more the lines between "good" and "bad" journals are blurred. Much questionable research is published in supposedly reputable journals, and occasionally we find good research appearing in apparently inferior publications. This leads me to question the importance of peer review and whether open access provides results comparable or superior to what appears in print journals.

### **Open access**

On this topic I have mixed views. Students are among the intended beneficiaries of this publishing innovation that provides easy and free access to medical research. But in fact most medical students have ready access to journals online

through the university's library. Few read print journals, let alone subscribe to them. Most students would not know (or care) whether a particular article comes from an open access journal or a conventional publication. So, from the viewpoint of students, residents, or practitioners, we need to wonder whether open access really matters. As noted above, the provenance of a medical article is no longer a clear, indisputable indication of its scientific validity. With the ease of access to an incredible amount of information via the internet, a student has little reason to prefer a high reputation print journal over any other.

Admittedly, some open access journals that practise "secondary review" are useful from a teaching point of view in that they force the reader to be critical: students and other readers cannot count on the fact that the article appears in a reputable peer-reviewed journal as a supposed guarantee of a certain level of quality. Nor can we assume that either system protects against fraud or other deceptive publication practices. It is well known that this occurs in peer-reviewed journals as well as in open access journals. However, many are convinced that open access fosters knowledge transfer because a financial barrier is removed.

### Peer review

My own perspective, which I try to transmit to students, is that the peer review system must be questioned, given the large number of papers we read in journal clubs that appear to be seriously flawed. That said, although I am frequently disappointed with the quality of research I find in many clinical journals, I remain attached to certain journals and am inclined to "trust" them over others. A good medical journal, like a good publisher or recording label, offers a certain assurance of quality and a comforting sense of familiarity.

Peer review, however flawed, is useful and offers some protection against outright fraud and statistical sleight of hand. Like most practicing physicians, I do not have the skill or inclination to understand and check all the details of the analyses presented in an article. It is therefore reassuring to think that this has been done – and done well – by someone else. Peer reviewers and editors also serve to improve to quality of written communication. Even the best writers benefit from careful editing, and the community of medical writers is not always blessed with the best writers.

In an ideal world, all doctors would have the skill and time to critically appraise the literature and form their own opinions about the quality of the research. In practical terms, however, this may only be possible for specialists or researchers in some narrow domains. But for the generalist it is clearly impossible. When Hippocrates wrote that the art (of medicine) is long but life is short, he didn't even have the internet to contend with!

### Knowledge transfer and implementation

For my students, most of whom will become clinicians not researchers, what matters most is whether a paper helps them to practise better medicine. They are increasingly aware of the revelations about the ways in which some pharmaceutical companies try to influence prescribing

habits by distorting the publication process. They count on journals (reviewers and editors) to prevent being led in the wrong directions, to the detriment of their patients.

It is important that students and practitioners cultivate a healthy skepticism about conclusions in the literature without falling into a nihilistic agnosticism: it is not the case that because drug companies overly influence some researchers, all research is therefore suspect. Some is good and useful. As practitioners, we must act, not just reflect and criticize. These actions should be based on our best evaluation of the available evidence. We are assisted by rigorous peer review, good editing, and high quality journals, whether they be traditional or open access. Together these elements, alongside our appreciation of the needs of the individual patient, influence what we choose to implement. This is medicine and it is far from an exact science.

### Barry Pless, researcher and editor, writes:

As a former editor of a BMJ Specialty Journal, I have a different perspective on many of the issues described above. Having spent nearly 30 years mostly doing research also shapes my views. In effect, our differing viewpoints typify the town-gown debate, or an academic vs a real-world viewpoint. And because much of my research involves injury prevention, it is policy makers and those in public health, not clinicians, who comprise the audience I try hardest to reach.

### Open access

This topic has been debated for well over a decade. At the start, it seemed that the proponents of open access were on the side of the angels and that there would not be much serious disagreement about the moral justification for the movement. Since then, however, the open access model has come under closer scrutiny,<sup>2,3</sup> and some have argued that both the conventional model (where readers or libraries pay) and the open access model (where authors pay) are simply different approaches to making a profit for someone beside the researcher.

If this view is true, it may be foolish to view all journals in either category as equivalent; they may actually overlap. Some traditional journals have generous policies that place all material in the public domain at no cost soon after print issues appear. Many make all material freely available immediately to readers in a designated list of low income countries. Similarly, some open access journals waive processing charges for authors from low income countries and for others who make a convincing request for exemption.

To add to the not-black-or-white argument, some years ago I decided that the survival of my journal required that we impose page charges, so even traditional journals may charge authors. By the same token, my experience on the editorial board of one open access journal made me realize how profit-oriented some such journals are. The cost of a print copy was high, and the author charge extremely high. Nor was it clear how readily, if at all, exemptions might be granted. Open access policies were developed with

those with grant funding in mind, typically biomedical researchers. This means that many clinical researchers and others (retirees, for example) without funding cannot publish in most open access journals. It also means that those with personal funds or those with government funding may more easily find a home for their work, even when the science does not merit publication. It seems reasonable to assume that peer review for some open access journals is influenced by the payment involved.

### Peer review

The last statement leads directly to the much-debated issue of peer review.<sup>4,5</sup> The criticisms have been well documented and are familiar to readers of *ESE*. Richard Smith, who, during his 25-year tenure as editor of the *BMJ* did more to examine the peer review process objectively in the hope of improving it, has emerged as the most severe critic.<sup>6,7</sup> His strongest single objection is that many journals have been manipulated by the pharmaceutical industry. More generally, he sees peer review as seriously flawed. Smith writes: “We ... know that [peer review] is slow, expensive, largely a lottery, poor at detecting error, ineffective at diagnosing fraud, biased, and prone to abuse. Sadly we also know ... that most of what appears in peer reviewed journals is scientifically weak.” This statement is supported by a large body of mostly critical research.

Clearly, this supports Charles Pless’s position, but I think both he and Smith go far too far. I also think their concerns apply much more to clinical and general journals than to public health or specialty journals. There is no substitute for peer review as an essential tool in the triage process. Most good journals receive many more papers than they can possibly publish; without reviewers, it would be entirely up to the editor to decide what to accept. And, although Charles Pless asserts that “the peer review system must be questioned given the large number of papers we read ... that are seriously flawed”, this criticism may apply more to “clinical” journals than to those in the public health field, perhaps because more is at stake financially. Few authors of papers in public health receive support from “industry” or advertisers. So, before we dismiss peer review entirely, it seems wise to ask whether having editors (with limited knowledge and expertise) make choices alone would result in fewer flawed papers. I think not.

I do, however, concede that as much as authors need journals, editors need papers to print! Accordingly, especially in journals intended to make a profit for their publisher, there is pressure to accept some imperfect papers, and in any event, few papers are scientifically impeccable. Astute, well-trained readers may be able to identify their shortcomings, take these into account, and decide if there is merit in what remains.

Finally, as a former editor of an international journal, I became convinced that North American reviewers tend to be tougher than those in Europe. If this is true, it may help explain why, in general, European journals are less highly regarded than those originating in Canada or the United States. Journal rankings show that readership and citations are considerably higher in journals that

are rigorously reviewed. In a recent study,<sup>8</sup> Filon and I set out to “determine whether author, country, journal, or topic were associated with the number of times an epidemiological publication is cited”. We compared a clinical topic, cardiology, with a public health topic, injury prevention, and concluded that “Journal and country appear to be the factors most strongly associated with frequency of citation. In particular, highly-cited articles are predominantly published in high-impact, high-circulation journals.” We also found that “topic” is a determinant of citations for the cardiology papers but not for those addressing injury prevention.

To further support my conclusion about European-North American differences I consulted the Australian Research Council’s Excellence in Research for Australia (ERA) initiative.<sup>9</sup> The criteria ERA uses are described as reliable, internationally recognized, comparable across disciplines, able to identify excellence, relevant to the research component of the discipline, repeatable, verifiable, time-bound, and having a behavioral impact. This is a tall order, but much work has gone into this effort and the results seem difficult to challenge.

Using ERA criteria, some interesting findings emerge. For example, in the category Medical and Health Sciences, only one European journal is listed, and it receives a C rating. In the public health domain, none receive a ranking above a B. In contrast, five American clinical journals and eight public health journals received an A\* or A ranking. Admittedly, selecting journals by words in their title (I selected journals with “European” or “American”) is debatable, and in any case these findings cannot prove that European reviewers are scientifically less rigorous. Moreover, even if North American peer review is truly tougher than European it may simply reflect the larger pool of reviewers the editors have to choose from – although, by the same token, the pool of papers being submitted is also larger.

Possibly more convincing evidence is found when the United Kingdom is compared with other countries in Europe. Investigating a possible relationship between editorial leadership and journal quality, Matarese compared 76 Medline indexed research journals from Italy and 76 from the UK and measured the quality of papers by using several bibliometric indexes.<sup>10</sup> Editorial leadership was evaluated through the information that journals required authors to supply. The main findings were that, compared to UK journals, Italian journals published fewer papers, less often had online archives, and had lower median impact factors and SCImago journal ranks. With respect to editorial leadership, Italian journals “less frequently required manuscripts to specify competing interests, authors’ contributions, funding, informed consent, or ethics review. No Italian journal adhered to COPE, CONSORT, or QUOROM statements, nor required clinical trial registration” whereas these elements were noted in between 15% and 43% of UK journals.

To conclude, I am convinced that peer review, even if it is only a marker for other indices of quality, is associated with more credible publications – which, in turn, are those whose papers are most likely to be adopted clinically.

### Knowledge transfer and implementation

Although I am a researcher I have often stated that in many fields, especially in public health, it is not more research that is needed but more attention to ensuring that what is known is fully applied. The implementation of research findings is different in the clinical sphere than in the public health domain. For authors of clinical research, the goal may be to persuade clinicians to switch from drug A to drug B or to use a new test to detect disease Y. Setting aside the often nefarious interventions of industry, this should be a straightforward process. But for authors promoting a public health strategy to prevent injuries, for example, the target is often a policy maker or politician. In this case, even if the evidence provided is compelling, it is less certain that the desired action will follow.

All that is certain in both situations – clinical and public health – is that the paper in question must be understandable. Clear writing is the first step in the process of knowledge transfer: communicating what the authors did and what they found, and this is the greatest challenge no matter where a paper is being written. Editors need to find practical ways to help authors, but authors need to work harder to write clearly.

A related problem is how to help consumers of research knowledge decide what papers provide results worth implementing, especially in the clinical context. As Charles Pless has noted, a starting point is identifying the “better” (more reliable) papers. The impact factor plays a large role, but what is often not fully appreciated is that it relates to journals, not individual papers, and it is individual papers that matter to students and practitioners. For articles, many metrics are available – for example, the number of times each is accessed and downloaded. As well, the importance of a paper (admittedly more for researchers than for practitioners) can be measured by counting citations using Scopus and ISI Web of Science.

Because we write from Quebec, we are compelled to dip into the murky waters of language. Editors agonize over what to do with a paper that appears scientifically sound but which has been written badly because the authors were unable to write in their first language. Ideally, journals would provide editorial assistance to such authors, and occasionally reviewers will do so. But, in general, this is too costly to be routinely provided. Ironically, the students Charles Pless refers to are educated in French, but the reality for them, as for many Europeans, is that most journals are in English. Hence, what influences them is not the language but how well and in what manner the material is delivered. And herein lies the problem. As one publication stated:

“Clinical medical journals have not been effective in meeting the information needs of practitioners and bridging the gap between clinical research and practice. The slow adoption of results of clinical research is at least partly due to the failure of clinical journals to disseminate information in a way that would motivate practitioners to change practice.... Strategies that may be useful include publication of pre-appraised evidence summaries and ‘clinical bottom-lines’ and giving (more) importance to systematic reviews.”<sup>11</sup>

### Conclusion

Open access, peer review, and knowledge transfer are strongly interwoven. In part, the first two may determine how well findings are implemented. This is equally likely for clinicians as it is for researchers, and these relationships also appear to hold internationally.

**Competing interests** None declared.

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