

## Biomedical review articles: What editors want from authors and peer reviewers

Bruce P. Squires, MD, PhD

Scientific reviews are perhaps the most misunderstood form of biomedical communication. Too often they are the product of the authors' desire to research the current state of knowledge about a particular topic and their expectation that everyone will benefit from reading the results. A typical example is one in which a resident, who, having prepared a thorough review for presentation at grand rounds, submits it for publication on the basis of a compliment or recommendation from a supervisor or attending physician. Inevitably the resident is disappointed and bewildered if the editor refuses to consider it.

In this editorial I will explain how we at *CMAJ* assess biomedical review articles.

### Preliminary evaluation

As I stated in the first article of this series<sup>1</sup> the preliminary evaluation of a newly received review article involves a check for correct format and an editorial assessment by one of the senior scientific editors.

First, we ensure that the covering letter and the submitted manuscript meet our requirements.<sup>2-5</sup> Second, we decide if the article is suitable for peer review. The question of suitability, however, involves criteria that differ slightly from those used to judge reports of original research and of clinical and community studies.

*CMAJ* is a general medical journal; therefore, a review article should ideally be of interest to general medical readers. It must catch their interest

quickly, provide useful clinical information and be understandable to those who are not necessarily experts in the topic being reviewed.

We have received various kinds of review articles. The first type is an exhaustive review of everything that has been written on a particular topic — a sort of annotated bibliography. I believe that these articles are not suitable for a general medical journal. They usually are too long, require very specialized knowledge and have a very high somnolence-promoting quality. They may be excellent as reference articles, but they do not provide the kind of information that a busy practitioner wants or needs. A suitable review article should provide answers to clinically relevant questions that have not as yet been well answered.

The second and third types of review articles are, as my predecessor, Dr. Peter Morgan, pointed out,<sup>6</sup> descriptive and evaluative: the first type brings the reader up to date on clinically useful concepts in a rapidly changing field; the second type answers a specific question (e.g., Does weight loss significantly reduce the complications of adult-onset diabetes mellitus?). Well-prepared descriptive and evaluative review articles of important topics or questions are always welcome but involve research and preparation efforts that many authors are unwilling to make.

The fourth type is unfortunately one that we commonly receive: the combined case report and review of the literature. This type arises, I suspect, from a review of the literature in preparation for a case presentation at grand rounds. I believe that the result is a case report that is too long to justify readers' time and a review article that is too limited to justify their interest. In most cases we will ask the authors to divide the manuscript into its two original parts. Although the resultant case report has a reasonable chance of passing peer review, the review article almost invariably does not pass.

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## Peer review

Mulrow<sup>7</sup> and Oxman and Guyatt<sup>8</sup> have outlined important questions that they believe readers should be asking when they read review articles (Table I). The similarity of the two sets of questions is obvious. Table II shows the questions that we have incorporated into our new review form for review articles. The questions about the abstract were adapted from our form for reviewing original research articles and clinical and community studies;<sup>1</sup> the remainder were adapted from the questions listed in Table I.

### The abstract

The abstract of a review article is no less important than the abstract of an original research article. The readers should be informed of the authors' reasons for reviewing the topic, their methods, their findings and their conclusions. Sentences that include the verb "are presented" or its equivalent have no place in an abstract.

### The introduction

As in an original research article the introduction of a review article must state the purpose of the review. This is particularly important because most readers want to know what questions will be considered before they take the time to read a long review.

The authors should state their methods for searching the literature. Did they do a systematic search, or did they simply use the reports in their personal reprint files? How certain can the readers be that the authors reviewed all the relevant literature?

The authors should explain their rationale for including certain articles and excluding others. Too often they include only studies that support their particular biases. The result is a biased statement of opinion, not an objective assessment and logical conclusion.

## The findings

By far the biggest problem I find is the authors' failure to assess the quality of the evidence they cite. The authors must not only identify the limitations of every study cited but must also analyse and discuss variations in the findings. In reviewing the results of clinical trials addressing the same question authors would do well to consider using meta-analysis: "the concept of aggregating the results of different experiments that address the same question".<sup>9</sup>

Authors should eschew including their own unpublished observations. This tactic, which is all too frequent, bypasses the normal review process for original research, and the observations are usually reported so briefly that others cannot

Table II — Questions on the new CMAJ form for reviewers of review articles

Abstract
Is the specific purpose of the review stated?
Are the search methods clearly described?
Are the important findings clearly summarized?
Are the major conclusions and recommendations clearly outlined?
Introduction
Is the specific purpose of the review clearly stated?
Were the sources and the methods for identifying the relevant sources clearly described?
Were the guidelines for including and excluding articles clearly identified?
Findings
Was the validity of the included articles assessed objectively?
Were limitations of the results of the relevant studies identified?
Was variation in the findings of relevant studies critically analysed?
Were the findings of the relevant studies combined appropriately?
Conclusions
Was a clear summary of pertinent findings provided?
Were the reviewers' conclusions supported by the evidence provided?
Were specific directives for new research initiatives proposed?

Table I — Guidelines for assessing research reviews

From Mulrow <sup>7</sup>	From Oxman and Guyatt <sup>8</sup>
Was the specific purpose of the review stated?	Were the questions and methods clearly stated?
Were sources and methods of the citation search identified?	Were comprehensive search methods used to locate relevant studies?
Were explicit guidelines provided that determined the material included in and excluded from the review?	Were explicit methods used to determine which articles to include in the review?
Was a methodologic validity assessment of material in the review performed?	Was the validity of the primary studies assessed?
Was the information systematically integrated with explication of data limitations and inconsistencies?	Was the assessment of the primary studies reproducible and free from bias?
Was the information integrated and weighted or pooled metrically?	Was variation in the findings of the relevant studies analysed?
Was a summary of pertinent findings provided?	Were the findings of the primary studies combined appropriately?
Were specific directives for new research initiatives proposed?	Were the reviewers' conclusions supported by the data cited?

even attempt to replicate the results. Citation of unpublished results and statements beginning with "in our experience" are unwelcome in reviews — or, for that matter, any other scientific paper.

### *The conclusion*

Reviews are often longer than original research articles, and the authors should summarize the pertinent findings before they draw their conclusions. Indeed, editors and reviewers spend much of their time ensuring that the authors' conclusions logically follow from the cited evidence. Finally, authors must be encouraged to propose new directions for research as a result of their review; I am amazed by the reticence of most authors to do this.

Review articles constitute a form of original research, albeit done in the library rather than in the laboratory or at the bedside. Increasingly, editors (and readers) are demanding that authors of biomedical review articles apply standards of research that are as high as those routinely used and expected in more traditional research activities.

In the Sept. 1 issue of *CMAJ* I will describe how we assess possibly the oldest form of biomedical manuscript, the case report.

### References

1. Squires BP: Biomedical manuscripts: What editors want from authors and peer reviewers. *Can Med Assoc J* 1989; 141: 17-19
2. Instructions for Authors. *Ibid*: 15
3. Directives aux auteurs. *Ibid*: 16
4. International Committee of Medical Journal Editors: Uniform requirements for manuscripts submitted to biomedical journals. *Can Med Assoc J* 1988; 138: 321-328
5. Comité international d'organisation des éditeurs médicaux: Recommandations aux auteurs pour des manuscrits devant être soumis à des revues biomédicales. *Can Med Assoc J* 1985; 132: 406-411
6. Morgan PP: Review articles: 1. Looking over the field. *Can Med Assoc J* 1986; 134: 11
7. Mulrow CD: The medical review article: state of the science. *Ann Intern Med* 1987; 106: 485-488
8. Oxman AD, Guyatt GH: Guidelines for reading literature reviews. *Can Med Assoc J* 1988; 138: 697-703
9. Naylor CD: Two cheers for meta-analysis: problems and opportunities in aggregating results of clinical trials. *Ibid*: 891-895



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