

## How to write a review article

*Robin CN Williamson*

**Writing a good review article is a real challenge. It requires not just a detailed literature search but a thorough 'digest' of the material obtained. Readers seek an up-to-date guide through a morass of data that has been sifted by the author and then integrated into a coherent and authoritative account.**

### A POPULAR FORMAT

I used to have a close involvement with a surgical journal that conducted regular surveys of its readership. The editors would invite comments on the type of article included and the appropriate balance between original material and expert review. 'More review articles please' was a consistent refrain. Authors like review articles because they help to establish their own status as experts in the field. Editors like them because they are good for the citation index. Readers like them because they provide a short cut to the acquisition of knowledge.

Journals tend to be more readily available than textbooks, especially if they are published online. Moreover, the information they contain is usually more up-to-date, given the gestation time of most books (other than conference proceedings). Review articles are especially popular with those researching in the same field or those required to lecture on the topic. They help to assuage the constant fear that crucial new facts have been overlooked. An author or lecturer may be dull or verbose, but he/she hates to be considered out of touch.

Before considering the genesis of a review article, it may help to regard their place in the overall scheme of medical writing. Although the balance varies widely from one medical journal to another, most published articles can be classified into one of six different categories, as follows:

1. Leading articles or editorials, which are generally commissioned by the editor. They should be short and authoritative statements that highlight a topical subject. Sometimes the editorial arises from a paper that

is published in the same issue of the journal, in which case it should aim to set these new data in context with previous related work.

2. Review articles, which are generally unsolicited and which set out to cover the field in much greater depth than an editorial. It follows that a review article should be much more heavily referenced: it is the main course not the starter.
3. Original articles, which present new clinical or laboratory studies. Each original article will try to relate the new findings to the old, but it is the task of a review article to take an objective and comprehensive look at the whole field.
4. Case reports, which should briefly present one or two patients of exceptional interest. Beware the format 'case report and review of the literature'. A detailed review is seldom justified on the basis of such slender experience. Three or more examples of a rare condition might represent a small series that is worth discussing at slightly greater length, but for a simple case report you should keep the references to a bare minimum (as often dictated by the instructions to authors).
5. Debates. Some journals choose to highlight a controversial topic not with an editorial or review article that weighs up the arguments and reaches an interim verdict itself but with a pair of articles that present alternative views and allow readers to make up their own minds. The 'debate' format may also be used to advance a new hypothesis or publicize a piece of lateral thinking.
6. Letters to the editor, which allow the percipient reader to correct a point that has been missed by the referees and the editorial board (Goodman,

2001) or to draw attention to a relevant personal contribution.

Thus, a review article differs from an editorial primarily in the extent of its coverage, but partly also in the requirement for topicality. A good review article is valuable even if it covers a well established field, although a wise author will still wish to draw particular attention to innovative contributions.

### THE AUTHORS' CREDENTIALS

The urge to publish a review article might follow a set of clinical or experimental studies centred on a common theme or a detailed literature search undertaken to write up a retrospective case series. You may feel that it is a pity to waste all the knowledge gained from this exercise. Perhaps the field is one that is expanding fast or is relatively under-reported.

The potential author of a review article has often conducted a period of formal research towards a higher degree. You will then have concentrated upon the subject for a couple of years and will have digested a large number of papers for the 'background' to a thesis, thereby becoming a world expert on what may be quite a narrow area. These are appropriate credentials for attempting to write a review article provided that you can appreciate that a good review is a rather different entity from the historical background to a thesis. It is necessary to be more selective and more concise, but this need will be revisited below.

Some of the best review articles are written by experts who have worked in the field for many years and have learned to assess the weight of evidence in a particular area, but such experts may have insufficient time or interest to tackle the substantial amount of fresh work that is needed. They have probably covered the subject before in origi-

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nal articles, book chapters or previous review articles. A 'catch 22' situation can therefore arise. The new initiate has the time and interest to undertake a review, yet the journal editor may be uncertain of his/her track record and feel that he/she lacks the authority for the successful overview of a complex subject. Put simply, you may be anxious to make your name in the field but find it difficult to get your work published because no-one has heard of you.

One way to avoid this outcome is to ensure that you cite your own original research in the bibliography. If the review article is good enough, of course, then the problem is overcome by the self-evident maturity of its author. An alternative ploy is to have multiple authors, the first of these carrying out the literature search while the last and more senior gives the whole work his/her personal stamp. This formula often works very well in practice, but there are two caveats. First, in the context of a review article (or book chapter) multiple authors should mean only two or three, depending upon the spread of subject areas; a combination of basic scientist and clinician can be very effective in this regard.

Second, authorship of a review article implies a substantial contribution, as it should for any type of medical writing. It is not enough for the senior author just to put his/her name to the text after a cursory inspection of the initial draft. He/she should have been involved at the planning stage and should have played an active part in the content and style of the work. In this way, the authority of experience can be harnessed to the vigour of youth. I do not suppose that I am the only editor to have struggled through an article and wondered if the senior author had ever taken the trouble to read it before putting his/her name to such palpably inadequate work.

## PREPARATION

Writing is a hard discipline and especially so in the case of a review article, in which the author has to decide where to begin and end and how much to include. Careful preparation can smooth the subsequent path. Before putting pen to paper or fingers to key-

board, the following preparatory steps should be considered:

1. It goes without saying that you must read widely on the subject before attempting a critical review. It takes time, effort and experience to assimilate the literature plus a degree of organizational skill. Resist the temptation to cite every single paper that you have read. Some writings can safely be discarded as irrelevant, while others will have been superseded by fresh work in the field. It is crucial to be up to date; nothing can scupper a review article as quickly as the discovery that the author has overlooked important new contributions. This risk can arise when you return to the field after an interval of a couple of years.
2. A comprehensive review article represents a considerable investment on the authors' part, and it is disappointing to have the work turned down because the journal has recently accepted a similar paper. Once you have done the initial assessment, therefore, it may be worth writing to the editor to say that you plan to submit a review article by a certain date and inviting his/her comments. Most editors are glad to receive good reviews, while being careful to avoid guarantees of acceptance. They will surely let you know if any similar article is going through the editorial process or if they feel that your project is of limited interest to the readers. One snag of this policy arises if you set a submission date that lies too far ahead or that you are unable to keep. Medical knowledge moves on apace, and the editor may become bored of waiting.
3. Think carefully about the authorship. Your best friend may not be the most appropriate ally in this regard. Some of the best reviews integrate clinical work with basic science, and you may not necessarily have the expertise to cover both parts with equal authority. You stray beyond the bounds of experience at your peril. Clinicians are irritated by laboratory scientists who purport to understand patient care, and there is no doubt that the reverse holds true.

If you decide to involve a senior colleague, be sure to elicit his/her active input from an early stage. I have known problems arise when a young doctor decides to continue in a field of research beyond the period of his/her thesis and wishes to leave the nest and fly by him/herself. His/her erstwhile supervisor may feel nettled about this show of independence and wish to be included as a co-author into the distant future. Whereas original work performed under guidance or supervision should never be published without permission, review articles are a grey area. With reasonable good will on both sides, the matter should be soluble by proper consultation. A wise supervisor should rejoice if he/she has launched another expert in the field and a tactful fledgling esteems the advice of his/her mentor even if he/she does not follow it slavishly.

4. Be sure to adopt the house style of your target journal. Time taken reading the instructions to authors is seldom time wasted. Courtesies count in the field of medical publishing. You should therefore adopt American spelling if you plan to submit (or resubmit) your work to a journal published in the United States. You will get a feel for the layout and style of the journal if you read other reviews that have been published in recent issues.

## THE FORMAT

The writer of a review article has an immediate difficulty to overcome in organizing the layout. There is no uniformly accepted convention that equates to the introduction, methods, results and discussion of an original article. Although some might regard it as a straitjacket, I have always found this standard arrangement both comforting and convenient (Williamson, 1996). With a review article, by contrast, the organization of material is left to the author's own devices. It can even be difficult to concoct a meaningful abstract – assuming that this is a requirement of the journal – which avoids clichés such as 'the investigation and management are discussed'. On mature reflection,

however, it should be possible to summarize the most important matters that you have discussed, akin to writing the key points of a chapter. Here, in particular, it is valuable to consult other reviews that have appeared in the same journal.

The introduction assumes considerable importance. One should set out clearly the objectives of the paper and describe the source material, e.g. a literature search that starts with a previous review in, say, 1970. The use of subheadings is essential. Apart from breaking up acres of text, they clarify the scope of your work and allow a cursory reader to focus on a few areas of special interest.

A review article should not be a vehicle for presenting unpublished personal data, but it is appropriate to record one's own published contributions to the field. Nor is it a mathematical exercise such as a meta-analysis, in which statistical significance is sought from a series of related studies. There is room for tables that summarize published data or highlight conflicting work in the literature, but the cornerstone of a good review is a balanced text that guides the reader through the wealth of available material.

Case reports are not generally included, although it might be reasonable to present a short illustrative example. A limited number of figures can achieve the same effect in a more attractive fashion, provided that the legends give sufficient detail to the reader. At the end of the review, you should try to draw some overall conclusions and point to areas in which future work is needed.

A chief reason for the enduring popularity of review articles derives from an extensive bibliography, so care should be devoted to this section. Readers use a good review to gain a rapid entrée to the relevant literature. In gratitude, they are likely to cite your article when they write their own paper on some aspect of the subject. Please ensure that the references are correct; it is annoying to try and follow up a promising lead only to lose track of the crucial paper through inaccuracies in the volume number or year of issue listed. There is no magic number of references for a review, but in practice it will often exceed one hundred if the topic is of sufficient interest

and the corpus of published work allows. The skill lies in making every reference count – one way to do this is to refer to other papers that have summarized certain aspects of the field in a useful manner. This ploy is especially helpful if you want to describe the early development of a subject without citing each and every historical reference.

### THE STYLE

I have left this aspect to the last because it is so difficult to categorize what distinguishes an enjoyable and informative paper from a turgid account sure to deter all but the most avid seeker after knowledge. Doctors tend to be busy people who are unlikely to bother with a dreary treatise; they expect a review to be both succinct and comprehensive, both readable and logical.

The ideal review starts with a careful choice of material, describing important developments and setting out controversies, and it presents the whole in an attractive package. Above all, readers expect authoritative comment rather than annotated bibliography. You are the expert: it is not enough just to set out the facts for and against a particular theory; you are expected to interpret them on behalf of the reader. You have had the time to consider the evidence, so try to impart your own opinion without excessive slant one way or the other. The reader seeks an informed guide through the relevant literature and will accept a certain amount of partiality in your verdict if you present the crux of the argu-

ment. If not, then the editor is likely to publish the ensuing correspondence, which may give you another chance to express the reasons for your opinion.

A review article is different from the background section of a thesis, in which the author might reasonably wish to cite almost any work related to the field if only to demonstrate the breadth of his/her reading. It is more compressed and must therefore be selective. At first sight, writing a review might seem to be easier than writing an original paper, which requires the design and conduct of novel research. However, it can take almost as long to sift through the published work and provide a coherent account of a complex subject. Be prepared to seek advice and to pursue perfection through several drafts. Try to adopt a style that progresses logically from one paragraph to the next. Each paragraph is like a mini paper. It introduces a concept, tosses the arguments to and fro and concludes with a summary statement that leads logically to its successor. This maintains a constant thread and with it the reader's interest. A well-written review should be immensely satisfying to you as the author, and it is timeless in the sense that it encapsulates knowledge at a particular moment. **HM**

*Conflict of interest: The author edits the journal HPB and is on a number of other editorial boards of journals that welcome well-written review articles.*

Goodman NW (2001) How to write a critical letter and respond to one. *Hosp Med* **62**: 426–7  
Williamson RCN (1996) Writing a surgical paper. *Ann Acad Med Singapore* **25**: 305–8

### KEY POINTS

- Do not underestimate the amount of work required to provide a high-quality review article.
- Give careful thought to the need for suitable co-authors (if any).
- Embark on your literature search, then 'digest' the relevant papers.
- Aim to impart your personal stamp on the work you discuss. You are the expert, so the reader expects you to weigh up the evidence and reach a mature conclusion. Be succinct as well as authoritative.
- Remember that a good review article differs from the background section of a thesis by being more selective in its coverage.
- Give thought to the best layout since there is no uniform convention. Use subheadings and consider a little illustrative material.
- Introduce the scope of the article and then proceed in a logical succession of paragraphs towards a measured conclusion.
- Provide a plentiful and accurate set of references. Your work is likely to act as source material for others working in the field.