How to write your first paper

Philip N Baker

Abstract

An author's first paper is often the most difficult to write. However, the appropriate dissemination of the results, including the presentation of findings for peer review, is an important responsibility of all who conduct research. Key issues include the choice of which journal to submit to, and the determination of co-authorship status. Each facet of the paper (Title, Introduction, Methods, Results, Discussion, References, Abstract) requires attention, as does the covering letter to the journal editor.

Keywords paper; publication; research

First of all, you need to think about what is motivating you to write your article. You may have finished a study and feel that the findings are so important that they must be disseminated to as wide an audience as possible. Alternatively, you may feel that writing a paper may enhance your CV and your future career prospects. Perhaps you need to silence a colleague who is 'nagging' you to write up a clinical finding. For many, there will be a combination of factors; just reflect, will the paper merit your effort and will you be proud of the finished article?

Before you start writing, it is a good idea to decide which journal you are going to send your manuscript to. Different journals require articles written in particular style, and the choice of journal will govern the focus of a paper. For example, if a study of a novel imaging technique in pregnancy is considered, a scientific journal will be most likely to accept an article concerning the novelty of the technique; an article focused on the application of the technique to pregnancy would be best suited to an obstetric journal, and a paper detailing the wider clinical applications might be accepted into a general clinical journal. In general, it is easier to get a paper published in a journal of low readership than one which is widely read. Each journal has an 'impact factor' which indicates how often papers published in the journal are cited by others; the impact factor of the *Lancet* is higher than that of *Placenta*. You should be sensible; very few people have their first papers published in *Nature* or the *New England Journal of Medicine*, but there is little to be lost by aiming high. If your paper is rejected, you can always resubmit to a journal with a lower impact factor. Once you have made your choice, you should obtain the instructions for authors that pertain to the journal.

Title

When you read the titles of some published papers, you get the impression that the authors have selected as esoteric a title as possible, in the hope that this will dissuade anyone from reading the paper. Other titles impart minimal information about the paper they pertain to. You are not writing a detective novel: the best titles detail the major result or finding of the work performed. There are, however, ways of emphasizing that your work makes an original contribution. In an article describing how to write 'nifty titles' Yankelowitz (1980) suggested the following strategies:

- Certain phases imply soundness: 'A randomized trial of….' 'Multiple linear regression analysis of…….'
- Some phrases suggest honesty: 'The failure of…… to influence……' 'The unreliability of…… in assessing….'
- Other phrases sound innovative: 'The pathophysiological relationship between…… and …… : a hypothesis.' 'The…… factor: a critical new parameter in examining…….'
- Further titles suggest timeliness: 'The relationship of…… to urban health care.' Sadly, some papers never make it past the title — so press on.

Authorship

Your next decision concerns the authorship of the paper. This can occasionally be a source of conflict; potential authorship is best addressed before any writing commences and ideally before the research begins. If you have performed most of the work and are writing the paper (or at least the first draft), then you will generally be the first author. The senior author, who is supervising you and your work, will typically be the final author. Other individuals who have contributed to the study design, the work detailed in the paper, and the writing of the manuscript, may also be entitled to be an author, and the order of these individuals should reflect their contribution. It is your job to ensure that all the authors have made a valid contribution; many of the journals stipulate specific criteria. If you feel that an individual's efforts do not merit co-authorship, one alternative is to highlight their assistance in the acknowledgements section; for example, if a colleague merely facilitated access to patients, this would not justify authorship. It is also your responsibility to ensure that all co-authors have seen and approved the final version of the manuscript before it is submitted.

Introduction

The introduction should explain why it was important that you performed the study. You should provide a brief background, focussing on the aspects under investigation. Although statements in your introduction should be fully referenced, your readers should be able to understand your introduction without looking up the references. Try to tailor your introduction to the journal you are planning to submit to. For example, if you write a paper on screening for Edwards Syndrome, you will need far greater detail regarding the condition for the *British Medical Journal* than for *Prenatal Diagnosis*. Above all, you should clearly state the question you sought to answer and the hypothesis behind your study.

Methodology

This section is often one of the easiest to write. You should describe how you performed the study, with sufficient detail to enable any reader to repeat the work. If a particular aspect of the

Philip N Baker *FRCOG FRCSC FMedSci is Professor of Obstetrics & Gynecology, Faculty of Medicine and Dentistry, University of Alberta, Edmonton, Canada.*

methodology has been fully described in a previous publication, it is appropriate to cite the previous paper and only provide brief details. The steps taken to validate the technique or assay should be included, as should inclusion and exclusion criteria of patient selection. You may need to pay particular attention to the statistical methods detailed in the paper; if you have qualms or concerns regarding your statistical analysis, you should discuss these with your co-authors or with a statistician associated with your hospital.

Results

You should spend some time deciding how best to present your data; your findings could be described in the form of tables, graphs or written text. You should try not to duplicate the presentation of your data in more than one form. The results section is not the place for any speculation or interpretation of your findings; you should leave any such considerations to the discussion.

Discussion

You should consider whether the study has answered the questions that it was designed to address and whether the hypothesis proposed in the introduction has been proven. You should consider the implications of your work; are changes to clinical practice indicated or are further investigations warranted? This section provides an opportunity to speculate, to extrapolate, and to consider your findings with respect to previous literature — highlighting areas of agreement and explaining areas of disagreement. You may choose to identify caveats to the study, or modifications which would improve any future studies.

References

Do not neglect this section; you need to ensure that it is free from errors and omissions. An author that you have forgotten to cite, or who you have misinterpreted, may be a reviewer of your paper. Readers will rapidly become frustrated if they cannot find the reference you have quoted, due to a typographical error. Different journals have different preferences for the style and format of references; the use of a reference manager software package will facilitate changing this style if your paper is rejected and needs to be submitted to a different journal.

Abstract

Although the abstract precedes the introduction, you are probably best advised to defer writing this until the rest of the manuscript has been completed. The abstract is the most important part of the paper; far more people will read it than the body of the paper. Your abstract should thus be as clear and informative as possible. The abstract also needs to be as concise as possible, and many journals have a word limit. Some journals require abstracts to be structured (hypothesis/rationale, methods, results, conclusion); others request a single paragraph. You should review a few abstracts in the journal you are submitting to, in order to appreciate the format required.

Covering letter

Once the final draft is approved by all co-authors, you need to send your paper to the editor of the journal, along with a letter which details your submission and why the journal should consider your manuscript. You should be both concise and explicit in highlighting both the importance and the potential impact of your work. The author identified for correspondence does not need to be the first author; if you are about to change hospital it may be more sensible to choose one of your co-authors to correspond with the editor.

The response

Journals vary massively in their response times. At least two referees will need to assess your paper and you can only wait for the editor's reply. Responses can be divided into three categories:

- An acceptance without modification: this is most unusual — but celebrate.
- An invitation to respond to criticisms: your paper will usually be accepted if you can respond to the comments made by the editor/reviewers. You need to draft a detailed response which addresses each point in turn. Some of the criticisms are likely to be valid and sensible, but others may not be so reasonable. In your response, you should explain whether you have accepted each of the comments (having made appropriate revisions to the paper), or why the suggested alterations are inappropriate or unnecessary. It never does any harm to compliment the reviewer when suggested alterations enhance your paper. The editor may then accept you paper or suggest additional changes.
- Rejection: Disappointing, but you are in good company (James Joyce, JK Rowling, William Golding, amongst many others). Many papers are accepted by journals of higher impact than the original journal chosen. You should consider each of the criticisms made, and then revise your paper in response to comments which you feel are constructive and helpful. After discussion with your co-authors, you should then decide where to resubmit your manuscript. If your paper is repeatedly rejected, you need to reflect whether publication is merited.

Proofs

Shortly before an accepted paper is published, the corresponding author will receive proof copies from the publisher. Despite months having passed since the original submission, you will be expected to respond rapidly. You should read the proof copies carefully and correct any typographical errors, but no major changes should be made at this stage.

Most importantly, if you have got as far as reading this article, then do not falter; get the first draft of your paper written. It was almost certainly be easier than you fear. ◆

FURTHER READING

Yankelowitz BY. How to write nifty titles for your paper. *BMJ* 1980; **1:** 96.