"How to Write a Paper for Publication"

Rosenfeldt et al. (2000)

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How to Write a Paper for Publication

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Engaging in the scientific publication process can be for both altruistic and egotistical reasons; publication advances the state of scientific knowledge while advancing your institution and your career. Writing for publication means setting aside a location and time dedicated entirely to the process of planning and writing. It is easiest to begin with the Methods section, then the Results, followed by the Discussion, which is the most challenging part of a paper. A realistic assessment of the value of the article will determine the level of journal into which it is likely to gain acceptance. If your article is rejected by a journal, be consoled by the fact that 50% of articles that are initially rejected are eventually published. Following the steps outlined here can reduce the daunting task of writing to one of manageable proportions and can help overcome the mental block and procrastination that all of us have experienced when we set out to write a scientific paper. (Heart, Lung and Circulation 2000; 9: 82–87)

Key words: publishing, writing.

Writing a scientific paper and seeing it through to publication in a peer-reviewed journal is a major endeavour; it also represents a daunting challenge, especially for the inexperienced writer. As a worldwide group, cardiothoracic surgeons are poorly represented in the scientific literature. Despite their undoubted clinical and technical excellence, this lack of representation applies equally to cardiothoracic surgeons in Australia and New Zealand, as illustrated by the number of publications authored by these cardiothoracic surgeons compared with those of Scandinavia[1] for the period 1993–1997. A careful Medline search revealed that Australasian surgeons published a total of 186 papers, only half the 389 published by Scandinavians, both regions having similar populations and economic status according to 1990 census figures. Of additional concern is that only 33 of the 186 Australian publications had surgeons as their primary authors. The reality is that the 60 cardiothoracic surgeons operating in Australia for that period had an average publication rate equivalent to

only one primary paper per surgeon every 8 years. We suspect that Australian and New Zealand cardiologists are more prolific authors than their surgical counterparts but have no data on this point.

In an earlier publication we discussed some of the reasons why clinicians engage in the publication process and also considered the mechanics of writing for publication.[2] The present paper aims to be an additional guide to the various steps and hurdles encountered in producing a manuscript and eventually having it published.

Reasons for Writing

There are many reasons to write: to advance and disseminate knowledge, to advance your institution and to advance your career.

Advancing Knowledge

If you believe you have something worthwhile to say then publication in a peer-reviewed journal is the most far-reaching means of communication. This presupposes that you have new scientific data (original research), a novel clinical finding (case report) or a new insight or interpretation of existing knowledge (review article).

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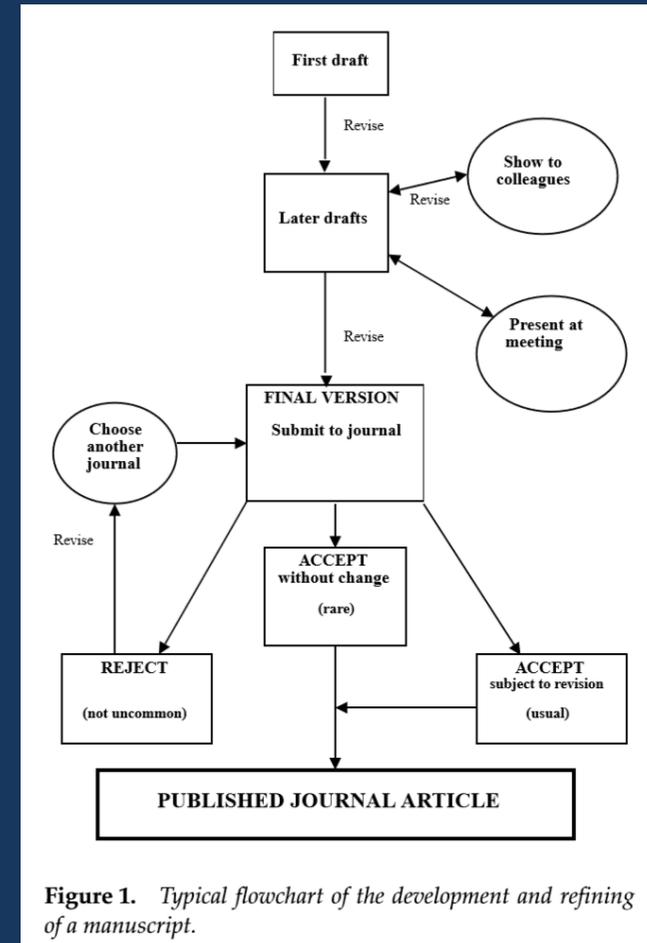- Writing
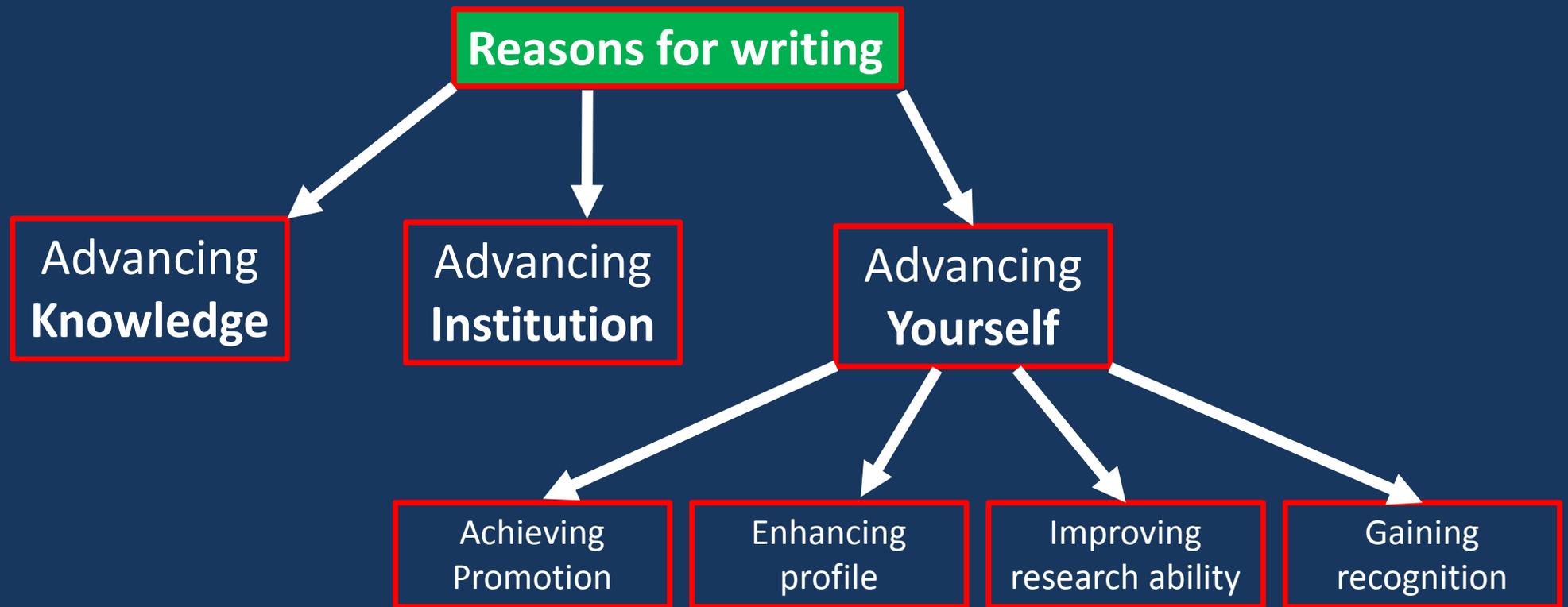
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Figure 1. *Typical flowchart of the development and refining of a manuscript.*

Before writing

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                    │  Reasons for writing │
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Reasons for writing

Advancing Knowledge

Advancing Institution

Advancing Yourself

Achieving Promotion

Enhancing profile

Improving research ability

Gaining recognition

Before writing

- Give yourself **TIME!**
  - **Hofstadter's Law**: It always takes longer than you expect, even when you take into account Hofstadter's Law.
  - Write/plot as you go–put yourself in the submission mind-set immediately

- Decide what you are going to write about
  - Report? Review? Project?

- Which journal?
  - A rough idea helps determine style and length (c.f. Nature Letters vs. Progress in Oceanography)

Getting started

- Making a plan is **productive** procrastination
  - Outline your headings, subheadings, Word/LaTeX code
    - Title/Top matter, Abstract, Introduction, Methods, Results, Discussion, Summary (or Conclusions), References
  - Add **plots/tables you'll keep** (e.g. domain maps)
  - Bullet any rough ideas of things **you may forget**

- Your thoughts and your final submission may be very different, depending on the "Results → Interpretation → Work → Results" cycle…

- … a manuscript is like pottery, it's never perfect to begin with…
  GET WRITING!

Writing

- To start, just try to write something **you** (but perhaps nobody else) can understand!

- Initial readability considerations:
  - Define abbreviations at first read
  - Avoid clichés and colloquialisms
  - Don't be afraid of being confident in what you've done
  - Complexity doesn't show intelligence, simplicity does…

Writing
1. Abstract

- First thing read by anyone, the most important to get right

- Write first, continue to iterate through the final submission

- Problem → Method → Major results (numbers!) → Cause (aka the 'Why') → Implication (aka the 'So What?')

- What have you done **for the first time?**

Writing
2. Method

- Put down the stuff that won't change depending on results, e.g. model/simulation information etc.

- Be **precise** (not verbose), could others replicate your work?

- Active vs. passive voice

- You may need to modify/extend this section later depending on the Results-Interpretation cycle

Writing
3. Results

Table 1. *The characteristics of four possible modes of data presentation in scientific publications.*

	Text	Table	Graph	Illustration
Content	+++	++++	++	+
Precision	+++	+++	++	+
Impact	+	++	++++	+++
Interest	+	++	+++	++++

- Figures & Tables **FIRST!**
  - These need to be **easily** understood
  - Labels, ticks, scales, numbers, captions
  - If it needs a lot of words to be explained, it's probably not a very good figure

- This section is **dry** but fundamental to your work
  - **Signpost**! (subheadings, sub-subheadings)
  - Don't forget the basic numbers, e.g. Mean ± Standard Deviation
  - The figure corresponding to a result can be put in brackets for brevity, e.g. "The domain mean temperature bias is 0.5°C **(Fig. 1)**" (c.f. "From Figure 1 we can see…")

- **Don't mix** with the discussion
  - **Bullet** your interpretations so you don't forget

Writing
4. Discussion

- What is the discussion? (i.e. what is science about! → the **WHY…**)
  - Describes the **cause** of your results (roughly qualitative)
  - Given the cause, **so what?** Why is your result actually important?
  - To argue the cause, you will need **other results** and **hard numbers** (roughly quantitative)
  - Your result in **context** of others' results and reasoning (what have others done!)
  - **Critical evaluation** of your work (i.e. you've shown why you might be right, but **why might you be wrong**?)
  - A **springboard** (where can others go from here?)

Writing
4. Discussion

- Do you need to **obtain more results**?

- The **difficult** section…

- **Signpost** in accordance with your results (helps you and the reader)

- Use **paragraphs** wisely

- **Don't introduce** any new results here, but do you need **obtain more results** to support your arguments?

Writing
4. Introduction

(Now you know what your contribution to the field is…)

- Set the scene: **zoom in** to the problem of your field

- **What are the problems and conflicts?** (… i.e. the ones that you will proceed to solve/resolve!)

- How are you going to solve these problems? i.e. **Paper outline**
  - What have you done **for the first time?**

Writing
4. References

- Journal specifications?

- Usage of **BibTex, Endnote** etc.

- Reference **models/data/simulations** (things you may forget)

- Don't feel you have to rack up references, they will come **naturally** as you find papers to **base/support your arguments**

- Remember to get relevant **permissions** (not just citations) for others' figures– this may take time to get so do it **early**

Finishing and submitting

- <u>1st Draft</u>

  - Finish with a title

  - **Accept** it will be messy

  - "Results → Interpretation → Work → Results" Cycle

- <u>Nth Draft</u>

  - **Iterate everything**! Work towards it being readable to everyone (not just you!)

  - Continuously work the abstract

  - Co-authors?

  - Put it down and return to it after a few days

  - It's finished when you're sick of it…

  - **Rachel White's Rule**: "When you think you're done, cut 20% of the words. Then you're done."

Finishing and submitting

- Decide on a journal (if not done already)
  - Look to your key papers and their journals for scope
  - What cost?
  - Where is it most likely to fit in/not get outright rejected?
  - Impact Factor?

- Check requirements
  - "Why is this work relevant/important?"
  - Edit manuscript according to journal specifications

Revisions

- **Be dispassionate** → criticisms help **modify/strengthen** your argument to get to the right answer

- Consider each point **in turn**
  - Decide whether each point is to be accepted and revisions made or rebutted with sufficient evidence against

- **Prioritise** what to revise to **minimise work** → think about what could change majorly
  - Do the stuff that may affect the entire paper structure **first**, i.e. the **critical** points
  - Then work on the other points that are **still relevant** (as some may become irrelevant after a paper-reworking)
  - Do the precision stuff (spelling/grammar/figure mods/referenes) **last**

- Iterate your manuscript **as you did previously**, and resubmit!