An Introduction to Writing Narrative and Systematic Reviews — Tasks, Tips and Traps for Aspiring Authors

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Adapting the poet Rudyard Kipling’s six honest serving men (what and why, when and how, where and who?), this article aims to give early career authors an introduction to writing reviews, both narrative and systematic. In particular, it offers guidance to aspiring authors in deciding what topic to review and what kind of review to write, and outlines a step-wise process that can be adopted from start to finish.

Keywords
Reviews • Systematic reviews • Journalology • Scientific writing • Evidence-based medicine

Since 2015, Heart, Lung and Circulation has offered an annual Best Review Prize to early career first authors of published reviews in the Journal [1,2]. To assist aspiring candidates and other contributors, the Journal hosted the session “What Editors are Looking for” in 2016 [3]. More recently, a satellite event to the 2017 Annual Scientific Meeting of the Cardiac Society of Australia and New Zealand, the Journal presented a follow-up session titled “Everything You Wanted to Know About Reviews and Reviewing”. Adapting the poet Rudyard Kipling’s six honest serving men (what and why, when and how, where and who?), the session aimed to give early career authors an introduction to writing reviews, both narrative and systematic. In short, this is an overview rather than a comprehensive coverage of the topic. In particular, meta-analysis was beyond the scope of the presentation, and is not addressed here.

“What” Is a Review?

Simply put, reviews do not present new data but do provide an assessment of what has already been published or presented. There are two standard types of reviews: narrative reviews, also known as traditional or non-systematic reviews; and, systematic reviews, which may or may not be followed by a meta-analysis.

A narrative review is the “older” format of the two, presenting a (non-systematic) summation and analysis of available literature on a specific topic of interest. Interestingly, probably because the “approach” is non-systematic, there are no acknowledged formal guidelines for writing narrative reviews. They generally address topics for which the more recently developed systematic review format is unsuitable or where, realistically, the topic is better covered as a narrative review; for example, historical perspectives, reviews of research involving various animal models and reviews of patient data from routine (uncontrolled) clinical practice are all considered kinds of narrative reviews [4].

Systematic reviews employ a more rigorous approach to “reviewing” the literature in a well-defined way. Because they are more likely to have considered bias in a methodical way, they are generally considered to represent a better evidence-based source of information than narrative reviews. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement has provided well-recognised, standardised guidelines for authors in writing up systematic reviews since 2009 [5].

*This article is based on “Everything You Wanted to Know about Reviews and Reviewing”, a Satellite Event Presentation by Professor A. Robert Denniss and Dr Ann Gregory at the CSANZ Annual Scientific Meeting, Perth, WA, Australia, August 2017.
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A meta-analysis is generally an extension of a systematic review, and involves taking the findings from several, similar studies on essentially the same subject and analysing the combined data using standardised statistical techniques. This is helpful when smaller sample sizes can be grouped together for a greater chance of a statistically (and hopefully, clinically) significant result.

Over the past few decades, academic biomedical journals have swung away from seeking narrative reviews to preferring systematic reviews, paralleling the general trend toward prioritising evidence-based medicine. However, more recently, the pendulum seems to have swung back, re-adjusting to make space for both types of reviews in recognition of their differing roles in the common scientific endeavour to pursue better understanding of health and disease, and to achieve better health outcomes for all.

The “Why” and “When” of Reviews

Green et al. said that for clinicians, reviews can be an efficient way of retrieving condensed and “filtered” information [6]. For students, a current review is likely to be more up-to-date than a textbook, and for those involved in developing health policy, a review can provide some indication of what measures to adopt (or not). Again, simply put, reviews can help to reduce information overload for all interested parties.

Reviews are also useful for medical researchers, and in several ways. A review can assist in refining a study hypothesis and in identifying pitfalls to avoid in the conduct of trials. Critical reviews can lead to new insights and justify future research directions, and although primary research is the traditional route to recognition for researchers, reviews are often widely read. Gasparyan has reported that reviews attract more journal, textbook, and thesis citations than any other type of article and, accordingly, substantially contribute to a journal’s impact [7]. In this continuing era of the Impact Factor and with the rise of other markers of use and influence, like article downloads and altmetrics (for example, social media mentions) [8], reviews published in highly-ranked peer reviewed journals have been said to be “a driving force” for visibility and sustainable growth of institutions [7].

For all these reasons and more, Heart Lung and Circulation welcomes the submission of narrative and systematic reviews, with or without meta-analyses. But, to satisfy typical editorial criteria, they need to be the right kind of reviews submitted at the right time and on the right topic. How can authors know what articles editors are looking for? To provide a general answer to the frequent question “What would you like us to write about?”, we suggest Pautasso’s graph (Figure 1), published in a computational biology journal, may help point aspiring authors and researchers — those who may know they definitely want to write a review (or conduct research) but are not certain what topic to write about or which review format to adopt — in the right direction [9].

Translating Pautasso’s picture into words, we need to know what literature is already “out there” — both original research and literature reviews, before working out what kind of review, if any, would be relevant at this time. Ideally, if we find much published research but no substantive reviews of the same, then it is time for a literature review, or an updated review or more recent research. If there is not much research at all on a topic, there may be a need to identify pertinent original research questions rather than conduct a review. However, if there is much research coupled with lots of reviews, then what may be most relevant is a review of reviews!

However, underpinning, and possibly at times overriding this approach, we would suggest that the key to publication success in a peer-reviewed journal of high quality is that, for any type of review, although the reviewed data may not be new, the assessment or analysis of the original material needs to be novel in some way.
Box 1

Narrative and Systematic Reviews Compared*

<table>
<thead>
<tr>
<th>Narrative</th>
<th>Systematic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Question</strong>: broad (er)</td>
<td><strong>Question</strong>: specific</td>
</tr>
<tr>
<td><strong>Source</strong>: not usually specified</td>
<td><strong>Source</strong>: comprehensive; explicit search approach</td>
</tr>
<tr>
<td><strong>Selection</strong>: potentially biased</td>
<td><strong>Selection</strong>: criterion-based; uniformly applied</td>
</tr>
<tr>
<td><strong>Evaluation</strong>: variable</td>
<td><strong>Evaluation</strong>: rigorous and critical</td>
</tr>
<tr>
<td><strong>Synthesis</strong>: often qualitative</td>
<td><strong>Synthesis</strong>: generally quantitative</td>
</tr>
<tr>
<td><strong>Inferences</strong>: sometimes evidence-based</td>
<td><strong>Inferences</strong>: usually evidence-based</td>
</tr>
</tbody>
</table>

*Adapted from Ref [10].

**“How” to Write a Narrative Review?**

The process of writing up a review can be distilled to a sequence of five simple steps. The first four steps are similar but different for a narrative review compared with a systematic review, reflecting the key differences between these review types (Box 1) [10]. The fifth step is common to both types of review. Critical aspects of each step can be represented by a key **Task**, and a **Tip** and **Trap** or two, as outlined below.

**Step 1: Define Topic and Audience**

For a narrative review, **Step 1 is to Define a Topic and the Intended Audience for Your Review** [9]. A **Tip** is to select a topic that not only holds your interest, but which is also of interest to others (editors, readers and researchers) because it is clearly relevant to contemporary clinical practice or policy in some way. The **Task** is to ensure that there is enough data in the literature to meet your needs to conduct a review but not so much data that the project is overwhelming [11]. Accordingly, a **Trap** for the novice researcher can be to select an all-encompassing topic — such as “atrial fibrillation”, which would generate so much research that a single review would not be feasible. Refining the topic by focussing on a specified aspect can be more successful, as can be seen in the series of State-of-the-Art reviews in *Heart, Lung and Circulation’s* Special Issue on Atrial Fibrillation in September 2017 [12].

**Step 2: Search and Re-Search the Literature**

The second step is to **Search and “Re-Search” the Literature** [9]. The **Task** is to identify the most relevant literature in your selected topic area, generally via keyword searches on relevant electronic databases, such as, but not only, PubMed, EMBASE, and the Cochrane Database of Systematic Reviews (Box 2). One **Tip** is that, when searching the literature, combining keywords with Boolean operators can be helpful — such as “AND”, “OR”, and “NOT”, which will find all articles, any articles or exclude articles with the identified keywords, respectively [11]. Another suggestion to keep in mind is that, except for seminal landmark papers, the most recent literature is likely to be most relevant literature; that is, up to 5–10 years old, and can depend on the amount of material available over time [11]. Lastly, if, during your searches, you find that similar reviews have already been published, you may wish to adjust the focus of your narrative review to ensure originality; that is, to ensure your work meets the key criterion of being novel. A **Trap** is to be aware of different spelling conventions in various databases; some but possibly not all databases will account for differences in Australian/UK and US spellings of terms, e.g., “haematology” versus “hematology” [11].

**Step 3: Be Critical**

The third step is to **Be Critical When Reading Your Selected Literature**. The **Trap** here is to “stop” at just summarising the literature: as Pautassos wrote, “reviewing the literature

Box 2

On-line Medical Literature Databases — some examples

<table>
<thead>
<tr>
<th>Database</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PubMed</td>
<td>A service of the US National Library of Medicine; indexes journal articles listed in MEDLINE</td>
</tr>
<tr>
<td>EMBASE</td>
<td>A biomedical on-line service of the publisher Elsevier; indexes mainly European and non-English literature sources</td>
</tr>
<tr>
<td>Cochrane</td>
<td>Database of Systematic Reviews</td>
</tr>
<tr>
<td>DARE</td>
<td>Database of Abstracts of and Reviews of Effectiveness</td>
</tr>
<tr>
<td>CINAHL</td>
<td>Cumulative Index to Nursing and Allied Health Literature</td>
</tr>
</tbody>
</table>
is not stamp collecting” [9]. In other words, the Task is to not only summarise the relevant literature but to also analyse it, to provide a critical discussion of it, and to identify methodological problems in reviewed studies or knowledge gaps. In fact, it is the analysis that can determine a useful purpose for your review, such as identifying a new insight, and it is this that can warrant publication of your paper as a novel addition to the literature. Our pragmatic Tip is to make notes and record your thoughts and likely references and citations as you read. Alternatively, or additionally, you may also find it useful to make notes or devise “roadmarkers” along your search “path”, in case you may want to retrace your steps or revisit material; a working ‘review’ diary can assist.

Step 4: Find a Logical Structure
The fourth step is to Find a Logical Structure for your narrative review [9]. The Task is to write up the review in a straightforward, effective way. It will have an introduction that sets the scene, and a conclusion that recapitulates the main points, and a body between the two. However, the body can be sub-divided in any number of ways, such as thematically, chronologically, in order of complexity, or otherwise. Whatever structure you choose, one Tip is to write up your review, point-by-point, paragraph-by-paragraph beginning with what cannot be left out of the manuscript. Here, standard writing techniques are relevant — that is, aim for clarity and absence of ambiguity. The Trap to avoid is to present your material in an “ungrouped” manner. So, order your material in a deliberate way; if it doesn’t seem to flow well, try rearranging or transposing core paragraphs or even try experimenting with a different structure or two. Diagrams and figures that complement your text can also assist in making your points clearly and efficiently. The abstract, a summary of the background and aim of your review, the literature search strategy, and the key messages stemming from your critical analysis is generally written last and, if well written, can help your review make an impact. Identifying keywords can help your work to be retrieved and cited by others.

“How” to Write a Systematic Review?
We suggest that the step-wise process of creating a systematic review is similar to that of a narrative review; however, as the word “systematic” implies, it is generally more “ordered” from start to finish.

Step 1: Frame a Research Question
The first step involves formally defining or “framing” a research question [13]. Here, our first Tip is that the mnemonic PICO can be helpful here in posing questions such as:

– What Person or Patient does this relate to?
– What is the relevant Intervention or cause?

– Is there something with which to Compare the intervention?
– And, what is the Outcome of interest? [14]

As for narrative reviews, the Task is to identify a topic of interest with sufficient literature to review. Another Tip is that a preliminary “scoping” review can help determine whether there is enough literature available for a useful review to be conducted. The corresponding Trap is to select a question that yields either too much or not enough data.

Step 2: Search and Re-Search the Literature
The second step of searching and re-searching the literature will involve the Task of identifying the relevant literature to be summarised and analysed, generally via a keyword search on relevant electronic databases but could also use other sources, such as the grey (“unpublished”) literature. In a systematic review, you are likely to be seeking to present a comprehensive and unbiased coverage of highly reliable, updated information. Generally, it is advised to search at least two, and preferably three, credible databases (Box 2). It is important to devise a systematic review protocol that specifies study selection criteria a priori from the systematic review question, with stated reasons for inclusion and exclusion, before conducting the literature search(es). The protocol will include specifying the minimal acceptable level of study design you will critique, for example, are you wanting to review observational cohort studies or only randomised controlled trials [13]? A Tip is to register your systematic review protocol, for example, with the Cochrane Collaboration or The International Prospective Register of Systematic Reviews (PROSPERO) [15]. A Trap is to embark on a systematic review that is already underway, so look for this carefully before you begin your own review.

Step 3: Be Critical
The Task involved in the third step of a systematic review is to summarise the literature in a critical way, to identify bias, and to make a useful recommendation based on your analysis. The patent Tip here is to closely follow the PRISMA Statement guidelines [5]. Design-based quality checklists and critical appraisal guides can help to work out which identified studies carry more weight in making recommendations or may be suitable for meta-analysis [13]. Data synthesis will involve tabulating study characteristics, study quality and outcomes, and the risks of publication bias and other biases in each identified study will need to be explored. As with narrative reviews, simply summarising is a Trap, and unlikely to lead to publication due to lack of sufficient novelty.

Step 4: Find a Logical Structure
The fourth step of structuring a systematic review can be simpler than that for a narrative review, in that a systematic review is likely to follow the traditional IMRAD (Introduction, Methods, Results and Discussion) format. The
introduction should describe the research question [4]. When writing up your methods, the key question to ask yourself is whether a reader could replicate the search based on the information provided, at a minimum, you will need to specify databases and years searched, keywords used, and the inclusion and exclusion criteria [4]. When presenting your results, once sources have been collected and analysed, it is important to report the synthesised information in a logical, organised way, that is, by grouping the sources in some way — for example, by similar findings or by level of evidence [7]. In the discussion section, as well as emphasising what your work adds to the body of knowledge, do remember that it is important to discuss the limitations as well as strengths of your review. In general, tables, boxes and diagrams, such as a PRISMA Flow Diagram (Figure 2) [5], can assist in presentation and understanding, and can be used to explain complex ideas or highlight your original messages. A Tip is to check that the right information is in the right section of the manuscript, for example, that your protocol is in the Methods section. A Trap is to present conclusions that are not related the material presented in earlier in the paper.

The Final Step: Reviewing Your Review

The fifth, and final, common step in “writing” your review, be it narrative or systematic, is to make use of feedback in revising your review before formal submission to a journal. The Task is to ensure your review is clear and accurate; that is, that it does not have any ambiguities, inaccuracies or inconsistencies. We suggest you invite others to read your work — from native English speakers to peers to senior colleagues. All can provide a useful perspective in identifying any inaccuracies, inconsistencies and any areas that may simply be difficult to comprehend. Addressing any such issues before submission can help you gain the most from subsequent peer review. A Tip is to read your review aloud to yourself or to someone else, including a non-expert. This can reveal errors missed when reading silently. It is a Trap to submit your manuscript for peer review without prior review and revision of some kind.

Some Special Considerations

Some aspects of writing a review are similar to those for writing any article [16]. However, we would like to highlight several special considerations.

“How” to Title Your Work?

It may be helpful to decide on a working title for your review that uses keywords chosen from the Medical Subject Headings (MeSH) of MEDLINE. Clear titles, understandable by non-experts or that use more specific, descriptive terms, such as “systematic review” can be helpful to readers and researchers alike (as well as editors). Titles posed as questions are also well accepted, as they may draw readers’ attention to emerging evidence or uncertainties ripe for further examination. It has been suggested that titles assist editors in selecting peer reviewers for your work; and, perhaps most importantly, that articles with titles that convey a specific and accurate description of manuscript content are more likely to be cited [7].

“Who” Will Author Your Review?

At the outset of your review project, it is good to know how many authors there will be, and who they will be. In general, it is thought reasonable to have up to five authors for a literature review, with a single nominated corresponding author. However, all co-authors must meet the International Committee of Medical Journal Editors (ICMJE) authorship criteria:

1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
2) drafting the article or revising it critically for important, intellectual content, and
3) approval of the final version.

How responsibilities are shared may assist in determining the order of authors. If more than one author is to be considered as the first author, this must be clearly indicated on submission of the manuscript.

“Where” Next?

This article is based on a pragmatic half-hour presentation aiming to encourage early career authors and researchers to
consider writing and submitting a review for potential publication in peer-reviewed academic journals. Aspiring authors will be able to find much more detailed information about writing and publishing reviews in the literature. For example, since the original PRISMA statement was published in 2009, several extensions have been published, and a scoping review has looked at evaluations of their uptake and impact [17]. We hope this introduction can provide a useful starting point and look forward to receiving novel narrative and systematic reviews for publication in Heart, Lung and Circulation.

References