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Introducing a new series on effective writing and publishing of scientific papers

This article introduces a series of writing tips that will appear each month in the *Journal of Clinical Epidemiology* (*JCE*) over the next year. The 12 papers aim to cover the whole process from starting to write the first draft of a paper to responding to reviewer comments (Table 1). The primary target audience are novice academic researchers, although the series may also be useful for senior researchers who supervise less experienced colleagues.

Writing and publishing scientific papers is the core business of every researcher. Original research papers form the culmination of a usually long trajectory, which starts with the development of a research idea and continues with acquiring funding and collecting and analyzing data. Besides original research articles, there are many other types, including systematic reviews, commentaries, and editorials. The scientific output medical researchers generate is not only important for society to improve health through advancement of knowledge but also for the individual researcher's career [1]. Effective scientific writing, however, is not easy.

Many novice academic researchers, and even senior researchers, may struggle with writing papers. Researchers often learn to write by doing it and receiving feedback on drafts from their supervisors, coauthors, and journals. However, such guidance is not always optimal, and many useful tips and tricks may remain disregarded for too long. We (D.K. and J.W.L.C.) noticed these problems during our own early writing career and also observed the difficulties of other authors when reviewing submitted work in our role as editorial board members of journals. We have therefore developed a training course to help authors address issues relating to successful scientific writing and publishing of articles (www.heuvellandcursus.nl).

Various factors impact on successful writing and publishing. Good scientific content of a paper alone does not guarantee its publication in a good journal. Many variables in the writing process determine whether a paper will be accepted for publication, but the good news is that authors can influence most of these [2]. Anticipation and modification of such determinants will increase an author's effectiveness, enabling them to get more done in less time; offering editors, reviewers, and readers a clear storyline; increasing enjoyment and reducing frustration; and raising the likelihood of having a paper accepted by a good journal.

Is there insufficient literature on writing and publishing in scholarly journals? Well, quite the contrary in fact. There are piles of textbooks and articles dealing with general aspects of scientific writing (e.g., see Ref. [3–8]). Furthermore, there is an important general guideline [9] and many specific guidelines (e.g., see Ref. [10,11]) to help authors improve the clarity, completeness, and transparency of their research reports. An exhaustive list of available guidelines and other resources to facilitate good research reporting is provided by the EQUATOR (Enhancing the QUAlity and Transparency Of health Research) network (http://www.equator-network.org) [5,6]. However, it is perhaps not only the abundance of information but also its sometimes nonspecific nature, which prevents young researchers from getting a clear overview of ways to effectively write and publish a biomedical research paper.

This new series of monthly writing tips builds on the existing literature about research reporting in *JCE* [1,2]. It aims to provide clear and concise key information on all major aspects of the process. Each of the 12 papers of the series is constructed as an easy-to-read one-pager, divided into background information (''What you should know'') and advice (''What you should do''). The advice uses the imperative, which is unusual in *JCE*. However, it fits the purpose of this series, which is to provide readers with experience-based do's and don'ts of effective writing and publishing. Each paper also contains a checklist providing a brief overview of the main points. The series can be read as a whole but has the advantage you can also only pick a particular item you need while writing. The series will be published as open access on *JCE's* web site to achieve maximum reach, partly because *JCE* wants to stimulate and facilitate researchers in low- and middle-income countries (http://www.journals.elsevier.com/journal-of-clinical-epidemiology).

The nature of this series does not allow us to address all possible aspects of writing and publishing. For example, it does not provide specific information for papers reporting on qualitative research. We think, however, that most issues addressed in the series are also useful for qualitative papers. For more information, we refer to the existing reporting guidelines [12–15]. Furthermore, the

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Table 1. List of subjects in the *Journal of Clinical Epidemiology* series on effective writing and publishing of scientific papers

1. How to get started
2. Title and abstract
3. Introduction
4. Methods
5. Results
6. Discussion
7. Tables and figures
8. References
9. Authorship
10. Choice of journal
11. Submitting a paper
12. Responding to reviewers

series does not address English spelling and grammar. General suggestions about language use have been very well addressed in a previous article published in this journal [2]. More specific suggestions, particularly tips for non-native speakers, largely depend on the individual author's background and are beyond the scope of the series.

The series was written to offer tips and tricks for clear and concise writing and publishing and to support authors in getting their message across to the scientific community. It is not a specific guide to successful publishing in *JCE*; its content applies to writing biomedical research papers in general. We hope that you will enjoy reading the series and that it will increase your pleasure in writing and the acceptance rate of your papers.

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References

[1] Knottnerus JA, Tugwell P. Communicating research to the peers. J Clin Epidemiol 2007;60:645–7.
[2] Guyatt GH, Brian Haynes R. Preparing reports for publication and responding to reviewers' comments. J Clin Epidemiol 2006;59:900–6.
[3] Fraser J. How to publish in biomedicine. 500 tips for success. Oxford/New York: Radcliffe Publishing; 2008.
[4] Sterk PJ, Rabe KF. The joy of writing a paper. Breathe 2008;4:225–31.
[5] Davis PM. Open access, readership, citations: a randomized controlled trial of scientific journal publishing. FASEB J 2011;25:2129–34.
[6] Jacques TS, Sebire NJ. The impact of article titles on citation hits: an analysis of general and specialist medical journals. JRSM Short Rep 2010;1(1):2.
[7] Chipperfield L, Citrome L, Clark J, David FS, Enck R, Evangelista M, et al. Authors' submission toolkit: a practical guide to getting your research published. Curr Med Res Opin 2010;26(8):1967–82.
[8] Cals JWL, Kotz D. Researcher identification: the right needle in the haystack. Lancet 2008;371:2152–3.
[9] International Committee of Medical Journal Editors, *Uniform requirements for manuscripts submitted to biomedical journals: writing and editing for biomedical publication*. Updated April 2010. Available at http://www.icmje.org., 2010.
[10] Schulz KF, Altman DG, Moher D. CONSORT 2010 Statement: updated guidelines for reporting parallel group randomised trials. J Clin Epidemiol 2010;63:834–40.
[11] von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. J Clin Epidemiol 2008;61:344–9.
[12] Clark J. How to peer review a qualitative manuscript. In: Godlee F, Jefferson TO, editors. Peer review in health sciences. 2nd ed. London, UK: BMJ Books; 2003:219–35.
[13] Kuper A, Lingard L, Levinson W. Critically appraising qualitative research. BMJ 2008;337:a1035.
[14] Greenhalgh T, Taylor R. Papers that go beyond numbers (qualitative research). BMJ 1997;315:740–3.
[15] Murphy E, Dingwall R, Greatbatch D, Parker S, Watson P. Qualitative research methods in health technology assessment: a review of the literature. Health Technol Assess 1998;2. iii-ix, 1–274.

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WRITING TIPS SERIES

Effective writing and publishing scientific papers—part I: how to get started

1. What you should know

Most researchers find it challenging to start writing a new paper and to remain motivated during the process. Every writer experiences good and bad writing days. There are, however, many possibilities to make writing generally more efficient and also more fun.

The order of the writing process does not have to be the same as the eventual order of the article sections, and you may find some sections easier to write than others. As the introduction and discussion sections are often perceived as the most difficult ones, you may find it easier to start with the methods and results. Furthermore, there are advantages to writing or finalizing the introduction and discussion at the end (but before the abstract) as their contents depend on the choice of journal and on the methods and findings presented in the paper.

Before actually starting to write a paper, it is absolutely vital that the first author as well as the main collaborators on the paper have a clear, shared understanding of the primary research objective and key findings of *this* paper. Without this, it will be impossible to write a clear and concise story. A paper is often one of many resulting from the same, large research project, and there is always more to report from that project than is possible within the word limit. Therefore, each individual paper has its own objective, allowing you to decide what needs to be reported and what can be omitted. It is also important to choose a potential journal and target audience at an early stage.

2. What you should do

Before wondering "how to start?," think about "when and where" you are most serene, creative, and productive in writing. What environment inspires you? Where are you most concentrated and least distracted? What day of the week and what time of the day do you find most fruitful for writing? It is helpful to set aside blocks of several hours of uninterrupted writing and to give writing the priority it deserves in your otherwise busy agenda.

Split the thinking from the writing! Structure your complete storyline before actually writing full sentences and paragraphs. Prepare a "skeleton," especially for the introduction and discussion section.

1. Use single-word topics or one-liners indicating the main message of each paragraph to create a logical and convincing storyline within the section (these headings later become the "lead sentences" of your paragraphs).
2. Gather key publications related to your paper and add notes under each heading with appropriate citations.
3. Replace the notes with rough sentences to build a paragraph (of approximately 6–8 sentences).
4. Rewrite the sentences until the whole paragraph reads well.
5. Check whether the paragraph has a "head" (i.e., a lead or first sentence that summarizes the essence of the paragraph) and "tail" (i.e., a bridge or final sentence that connects with the next paragraph).

Create empty tables and figures right at the beginning. This will force you to decide what results are most relevant, allowing you to create a clear and concise storyline. Discuss the skeleton and empty tables/figures with your main coauthors; at this stage, it is still easy to make major changes.

Keep up your motivation by planning writing sessions into your calendar (minimum 2 h) and dividing the writing of a paper into manageable chunks, which can be achieved during one session. Make writing a priority during these sessions and avoid any distractions such as answering e-mails. Go with the flow when you feel it is going well, but stop writing when you get stuck. Use several small breaks (5–10 min) during a session to clear your mind, and use longer breaks (several hours or days) to create sufficient time for reflection. Do not wait too long to ask for help and talk with coauthors about your paper. Define feasible intermediate goals (e.g., "I want to send a skeleton of my paper to my coauthors by the end of the week") and define your final goal (e.g., "I want to submit the paper to the journal before the end of the month"). Last but not least, reward yourself when reaching intermediate and final goals!

Checklist for how to start writing a paper

- Set aside time for writing and choose the optimal environment.
- Split the thinking from the writing: structure your complete storyline, and create empty tables/figures before actually writing full sentences and paragraphs.
- Choose a potential journal early.
- Divide the writing of a paper into manageable chunks.
- Make use of writing sessions and sufficient short and long breaks.
- Reward yourself for achieving intermediate- and long-term goals.

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WRITING TIPS SERIES

Effective writing and publishing scientific papers, part II: title and abstract

1. What you should know

The title and abstract are the most important parts of a paper. They are important for editors who will scan the title and abstract to decide if it should be sent out for external peer review; for reviewers, who will get a first impression of the paper; and for readers, as the title, abstract, and keywords are often the only parts of the paper that are freely accessible to everyone online, including readers in developing countries. Electronic search databases use words in the title and abstract to yield search results. In PubMed, the similarity between documents is measured by the words they have in common, and terms in the title are given more weight. It is therefore essential that the title and abstract contain all the important terms that potential readers may use in searching for relevant literature and "related articles."

The author instructions of your chosen journal give information on requirements for titles. Some allow only single titles, whereas others allow subtitles, possibly with a colon. Informative titles are those that present the outcome of the study (e.g., Drug x is effective in reducing cholesterol), whereas some journals prefer a descriptive title stating the subject and design of the study (e.g., Drug x for treatment of hypercholesterolemia: a placebo-controlled randomized trial). Journals may require a short running title to be used at the top or bottom of each page, facilitating reader navigation through the journal.

Journals usually require a structured abstract with headings (such as background, methods, results, and discussion). The abstract must clearly highlight the issue addressed by the study and the key findings. An abstract should be a stand-alone one, without any reference to the main text or the literature. Most journals have a strict word limit for the abstract (typically 200–300 words). While an abstract must be pleasant to read on its own, the narrative tone and style must be more telegraphic than that of the main text.

Checklist for title and abstract

- Construct title and abstract from keywords from all sections of the main text.
- Use important keywords at the beginning of the title.
- Avoid abbreviations and passive voice (title and abstract).
- Always state the objective and start the results section with the answer to the research question (abstract).
- Give sample size if you report percentages (abstract).
- Present effect sizes with confidence intervals (abstract).
- Check if the abstract covers the 4 Ws:
  - Background: What is known and why is this study needed?
  - Methods: What did you do?
  - Results: What did you find?
  - Discussion: What does it mean?
- Check that the abstract can be read independently from the main text.
- Revise every time the main text is revised (title and abstract).

2. What you should do

Take time to write the title and abstract. Enjoy their uniqueness. Take a quiet moment to re-read your paper and write down the keywords of the different sections. Determine if you need an informative or descriptive title. Use the keywords and active verbs to formulate several potential titles (e.g., Variable x *predicts* fracture risk). Try to write the most important keywords at the beginning of the title, as readers' attention is focused on the beginning. Although running titles may often contain abbreviations, avoid them in the title and abstract. Determine what factor makes your paper unique and try to stress that in the title. Make the title stand out from other literature in the field.

Use the keywords of each section of the paper to construct the abstract. Always state the objective of your study at the beginning. Follow the journal's format for abstracts strictly but creatively. Limit your statements on each section to two or three sentences. Try to use short phrases, simple language, and common word combinations, and avoid the passive voice as much as possible. Describe the important concepts using language fully consistent with the main text. Sentences may require a slightly different syntax if there are no headings because the journal requires an unstructured abstract.

The results section is the most important part of the abstract. Start by clearly and honestly stating the answer to the research question, including the primary outcome, and be self-critical when pondering how many secondary outcomes to include. If you report percentages, provide details of sample size. Never present only *P*-values but give effect sizes (with 95% confidence intervals).

Once the abstract is completed, it helps to ask yourself four questions, each relating to one section: "What is known and why is this study needed?" (Background), "What did we do?" (Methods), "What did we find?" (Results), and "What does it mean?" (Discussion). Also ask yourself "So what?"; this is what editors and reviewers often ask themselves when reviewing papers. Have three draft titles and the abstract ready before sending the paper to co-authors for comments. Critically revise them every time the main text undergoes revisions.

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WRITING TIPS SERIES

Effective writing and publishing scientific papers, part III: introduction

1. What you should know

Today many editors (and reviewers) of empirical papers prefer short and focused introductions. The purpose of the introduction is to give the reader the essential information to understand why you did the study and to state the research question. It establishes the context of the work being presented by summarizing the relevant literature to date (with references) and the current views on the problem you investigated. The introduction must allow readers to understand the biological, clinical, or methodological rationale for your study. It should be tailored to the journal you will submit the paper to. A good introduction will ''sell'' the study to editors, reviewers, readers, and sometimes even the media.

The structure of an introduction can be visualized as a funnel. The broadest part at the top (beginning) represents the general context of the study topic. It then narrows down to more topical contextual information, ending with the specific rationale of the study and, vitally, the aim, purpose, or objective. The introduction does not have a set maximum word count like the abstract but should be as concise as possible, typically not more than 10–15% of the full word count of the paper. The introduction starts the story line of your paper, so only start writing it once you have got the bigger picture of the outline of the paper.

2. What you should do

Ask yourself if you are happy with the outline. Preferably have a look at your skeleton, and choose the important lead sentences for the introduction (see the previous paper on ''How to start writing''). Take these lead sentences and develop them into four to five paragraphs, while keeping the funnel model in mind. Think about relevance, discussion of existing evidence, the gap in the evidence, and the promise (aim) of the current paper.

The introduction must not be a full review of the whole field you are researching. It should allow readers to understand why you set out to perform this study and why the specific aims are what they are. First discuss the general background, preferably stressing the magnitude of the problem or the societal burden of the disease. Then outline what is known on the specific subject and what is still unknown. This should connect with the discussion, but avoid too much overlap. Leave comparisons with other studies for the discussion. Identify the gap in the evidence and clearly explain why this knowledge is relevant. Do not hesitate to emphasize why this study is needed and important. Then proceed to the problem statement of the paper, which is the actual start of your story line. Remember that the final paragraph of the introduction will attract readers' attention. So end the introduction by stating your research question or hypothesis and explain briefly what you have done to answer this question. Try to combine this with what was done to answer the question, preferably indicating the study design. Doing so will create a nice bridge to the methods section, in which you will explain the approach in detail. Clearly separate the major (primary) from the minor (secondary) research questions. Be critical about including secondary aims, but if you want to mention them, use a separate sentence and make sure to label them as secondary aims.

Use clear, clean, and unemotional language. Try to use active verbs, and consider using signaling words (such as *to determine whether*, *to clarify this*, *to compare* …). Use present tense for established facts (e.g., ''low back pain *is* a common reason to consult physical therapists'') and past tense or present perfect for findings you do not consider established (e.g., ''two treatment sessions a week *proved* more beneficial than one session per week in a cohort study''). Back up important statements by a reference, and be sure to cite the source of the original data. Only choose those references that are truly relevant, and select the most relevant ones if you have more options. Be aware that editors appreciate citations to relevant papers in their journal as they indicate that you show an interest in its contents, and it may facilitate citation scores.

Checklist for the introduction

- Check if the introduction has a funnel shape with clear sections on
  - general background (what is this all about?);
  - what is known and what is unknown about this specific subject (why was this study needed, and why is it important?);
  - primary research question (what did we want to know?); and
  - study aim and design (what did we do to answer the research question?).
- Look at the length of the introduction (maximum 10–15% of the total word count).
- Determine if the introduction is the start of the story line of your paper by looking at your outline (skeleton).
- Ask yourself, ''Will this introduction sell my paper to editors, reviewers, readers, and the media?''

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WRITING TIPS SERIES

Effective writing and publishing scientific papers, part IV: methods

1. What you should know

If you consider a research study as a delicate dish of knowledge, a paper's methods section would be like a recipe that lists all the necessary ingredients of the study and how they need to be combined during cooking. Ideally, it allows the dish to be prepared again with the same result. The methods section ties the introduction to the results section to create a clear story line; it should present the obvious approach to answer the research question and define the structure in which the results will be presented later.

The methods section of a paper presenting original research from a quantitative study has four basic elements: study design, setting and subjects, data collection, and data analysis. It is quite common to use such subheadings to structure the section (the target journal may offer specific guidance). In the case of research in humans, the authority providing ethical clearance needs to be stated as well.

2. What you should do

Start by developing a ''skeleton'' with the basic elements of the methods section (see the first installment of this series). If available, refer to a published protocol or previously published papers from the same research project for additional information about the methods. This allows you to keep the methods section more concise. Be sure, however, to include all information that the reader needs to understand on how the key findings in this paper were derived.

Mention the design of the present study, such as randomized controlled trial, prospective/retrospective cohort study, case–control study, or cross-sectional survey. If you find it difficult to fit your study into a specific type of design, try to describe the key design components, for example whether it was an interventional and/or observational study and whether data were collected longitudinally and/or cross-sectionally.

Explain when and where the study was conducted, how the sample was recruited or selected, and which inclusion/exclusion criteria were applied. Provide a sample size calculation for studies set up to statistically test a specific hypothesis.

With regard to the data collection, define precisely what exposure (e.g., stressful life events) or intervention (e.g., cognitive behavioral therapy) you investigated, what outcomes you measured (e.g., depression), how you measured them (e.g., using a self-reported depression scale), and when measurements were made (e.g., during the screening visit and after 12 months of follow-up). Cite original research on existing measurement tools you used, and state if you designed a tool specifically for the study. Provide details of measurement properties (reproducibility, validity, and responsiveness) if these are crucial for the interpretation of the main results. A useful order if you used various measurements is to start with the outcome measure (or dependent variable), followed by the exposure measures (or main independent variables), and possible covariates.

Match the part on data analysis with the research questions. If you present a primary research question in your introduction and one or more secondary questions, start by explaining the primary analysis, followed by the secondary analyses. Provide sufficient detail on the statistical techniques you used; do not assume that readers understand what you did from the name of a technique. Be very clear about the definition and operationalization of the dependent and main independent variable, the use of covariates (i.e., if and how you adjusted your analyses), and the handling of missing data. Be honest and clear about the analyses you intended a priori to test your hypothesis and the analyses that were exploratory. Avoid putting results in the methods section, such as numbers of subjects recruited and followed up.

As there may be various ways to answer a research question, try to explain, where necessary, why you made certain methodological choices and why you think these were the best options given the context. You can demonstrate the credibility of your methods by citing previous research.

After you have drafted the methods section, ask yourself, ''Would a researcher be able to reproduce our study with the information I provide in this paper?'' Also check whether the section contains redundant information that is not necessary to understand the paper's story line. This check is particularly important when the paper is one of the many arising from a larger study. Only describe methods for which results are presented later.

Checklist for the methods section

- Include basic information on study design, setting and subjects, data collection, data analysis, and ethical approval
- Refer to previous publications from the same large research project, such as a study protocol, for additional information (if applicable)
- Consider providing detailed information on the methods as web-only supplementary materials
- Ask yourself, ''Would a researcher be able to reproduce the study with the information I provide in this paper?''

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WRITING TIPS SERIES

Effective writing and publishing scientific papers, part V: results

1. What you should know

The results section of an article presents a clear, concise, and objective description of the findings from a particular study and is mostly written in the past tense. The findings are presented without interpretation, as this should occur in the discussion section only. You may think of the results section as mirroring the methods section: For every method (what you did), there should be a corresponding result (what you found) and vice versa. A common order of elements is: recruitment/response, characteristics of the sample, findings from the primary analyses, secondary analyses, and any additional (unexpected) findings. Ideally, the results section is a dynamic interplay between text and figures/tables; the most important data will be shown in both. Tables and figures are particularly useful to present larger quantities of data (see part 7 of this series on ''Tables and figures'').

The word ''significant'' is often used in everyday language to stress something that is important or substantial, but in a scholarly article, it is probably better to use the words ''statistically significant'' if you want to report a difference proven by a statistical test. Although the reporting of *P*-values is very common in the medical literature, interpretation of findings based solely on *P*-values can be misleading and is therefore discouraged. The 95% confidence interval not only contains the information from *P*-values but also additionally shows the direction of the treatment effect (whether toward harm or benefit), the size of the effect estimate, and its degree of precision.

2. What you should do

Keep the story line of your paper in mind: Findings in the results section should match and answer the research questions from the introduction, using the procedures explained in the methods section. Retaining this focus will help you to be more concise, that is, to decide which findings to present and which to leave out.

Start the results section with a description of the recruitment/response of participants, or rather the yield of other procedures by which you obtained the data for your analyses. In prospective research, such as randomized controlled trials, it is particularly useful to present a flow chart of the recruitment procedure and the response of participants to treatment or measurement events (this typically becomes Figure 1 of your paper). The next step is to describe the characteristics of the study sample. Data on the sample can be presented very efficiently in a table (typically Table 1) and should include basic demographic characteristics as well as the major clinical and lifestyle variables.

Use more tables and figures to support the main text of the results section. As with all information from tables and figures, you should not repeat this information in its entirety in the text but only highlight the findings that support your hypothesis and those which are unexpected.

Begin a new paragraph for the results from the primary analyses. These should be presented early in the results section to stress their importance. Also use a new paragraph for results from secondary analyses. End the results section, if applicable, with a short paragraph on any additional (unexpected) findings. Make it clear that these findings result from ancillary (post hoc) analyses and are intended to generate new hypotheses. Avoid words such as ''remarkably'' or ''strikingly,'' which imply an interpretation of the findings. Use similar sentences and words to present similar results and do not try to find new ways to write the same (i.e., synonyms), as this will only confuse the reader.

Always use the same order when presenting data. For example, always report findings from the experimental group before those from the control group. Provide effect sizes, such as odds ratios or relative risks, together with their 95% confidence intervals. Never report results with *P*-values only. Make consistent use of meaningful decimals for reported figures. So unless you have a very large sample size (let us say $N >$ 1,000), present numerical values with one decimal place. Furthermore, present measures of central tendency together with their appropriate measures of variability: mean (standard deviation) or median (interquartile range). Always present the absolute number of cases in addition to relative measures (e.g., ''The percentage was 22% (33/150) in the intervention group compared with 15% (23/150) in the control group'').

Checklist for the results section

- Write the results section in the past tense.
- Structure roughly into: recruitment/response, sample characteristics, primary analyses, secondary analyses, and ancillary analyses.
- Match the results section with the methods section.
- Present findings without interpretation.
- Highlight findings from tables and figures in the text.
- Present estimates with 95% confidence intervals.
- Consider providing additional results in tables and figures as web-only supplementary material.

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WRITING TIPS SERIES

Effective writing and publishing scientific papers, part VI: discussion

1. What you should know

The purpose of the discussion section is to give the reader a summary of the main findings and to put them into context by comparing with previous work and discussing future implications and any shortcomings of the research design.

Although the structure of the introduction can be visualized as a funnel, the discussion can be visualized as an inverted funnel. Thus, the introduction and discussion together form an hourglass shape. The discussion starts with the narrowest part by answering the research question in the summary of main findings, and it then gradually widens out to comparisons with other studies and the interpretation of the study findings in the wider context of the study topic. Although the results section merely presents data, the discussion section offers an interpretation of the data, and should never present new results. A typical discussion section consists of: main findings, comparison of findings with those reported in the literature, strengths and limitations, and implications for clinical practice and/or research.

2. What you should do

Start thinking about the discussion even before collecting the first data. Many aspects and ''pearls and pitfalls'' of the study, as well as its relation with other studies in the field, will be discussed when developing, carrying out the research and analyzing the data, and in project group meetings. Make notes and a list of keywords as a reminder of these useful discussions, while remembering your story line at all times. Having such a list will greatly facilitate writing the first draft of the discussion section and will serve as a skeleton for this section of the paper (see ''How to start writing'').

Start by presenting the main findings, by answering the research question in exactly the same way as you stated it in the introduction section (see ''Introduction''). If you cannot present the main findings in three sentences, it may mean that you have forgotten the storyline of the paper. Do not waste words by repeating results in detail, and only use numbers or percentages if they are really necessary for your message. Do not ignore or cover up inconvenient results. Reviewers will pick them up anyway, and it weakens your paper if you try to hide them. Also, do mention unexpected findings by explicitly stating that they were unexpected and did not relate to a prior hypothesis; such honesty will strengthen your paper.

Include a separate subsection about the strengths and weaknesses of the study. Every study has its limitations, and you should make sure to mention them. Sometimes it is possible to counterbalance a limitation with a specific strength, for instance by referring to an ancillary analysis.

Checklist for the discussion

- Check if the discussion has a clear inverted funnel shape with distinct sections providing:
  -A summary of main findings (What did we find?);
  -Comparisons with other studies (What is known?, What is new?, and How does this fit in?),
  -Strengths and limitations (Are the findings true?
  -Implications (Are the findings important? What can we do with them?).
- Answer the research question in the first paragraph and check if this is in line with the research question posed in the introduction (hourglass model).
- Check to see if the discussion section does not present new results.
- Be frank about acknowledging limitations.
- Ensure it offers a clear ending to the storyline of the paper (citable statement).
- Formulate a clear and concise one-liner as the bottom line of the paper.

When comparing with other studies, discuss the reasons for differences and similarities with your results and do mention the limitations of those studies, but be respectful and objective. Importantly, try to stress what your data adds to the existing body of evidence.

Write the discussion by imagining yourself in a dialog with an interested reader. Depending on the scope of the journal, anticipate what kind of questions readers (and thus reviewers and editors) might have. This will help you decide what aspects deserve to get most attention, and thus the largest number of words, in your discussion. Be cautious about choosing words that are too strong. It is appropriate to use ''may'' or ''might.'' ''Show,'' ''demonstrate,'' and ''suggest'' are also more appropriate than ''prove,'' which can hardly ever be used in research.

Try to formulate possible implications (for clinical practice and/or research, depending on the focus of the paper). Never, ever(!), just write that further research is needed; this is practically the same as telling people not to forget to breathe. Similarly, do not try to ''sell'' or announce future studies, as the journal editors or its readers do not have access to those data at that moment. Embrace the uniqueness of this specific study and always remember to stick to the original storyline of the paper.

End the discussion section with a conclusion presenting your findings in light of the evidence in the field and the specific strengths and limitations of your research. Try to think of it as the one-liner (citable statement) that readers must remember when having seen your work.

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Journal of Clinical Epidemiology

WRITING TIPS SERIES

Effective writing and publishing scientific papers, part VII: tables and figures

1. What you should know

Tables and figures are an efficient way of presenting findings from a study. If they are designed well, they provide more information than an author could possibly put into words. A paper's key findings should be presented in tables and figures, as readers will look at them to get an overview of the study results. Importantly, they must be self-explanatory; a reader should be able to fully understand the information without having to read the text. Most journals allow only a limited number of tables and figures to be part of the print version of a paper (often around 5–6). However, additional illustrations can usually be submitted as supplementary material for readers to download from the journal's Web site.

It is highly recommended to design the layout of tables and figures carefully; a clear and suitable layout emphasizes the credibility of the study results, which is essential for the peer-reviewing process. Chaotic illustrations, on the other hand, will irritate and frustrate editors and reviewers, thereby reducing the chances of acceptance. Using special software to prepare figures may improve their quality. Journals usually adapt the layout of tables to their own style during the copy editing process, but often not that of figures. It is therefore important for authors to ensure that the contents of figures are correct and readable. Note that permission is needed if you want to use a figure created by somebody else.

Both tables and figures should have a clear relation with the text of the paper. They should be referred to in the text in a chronological order starting with 1 (e.g., "Table 1 shows …;" "We observed … (Figure 1)"). In clinical research papers, Table 1 usually shows the baseline characteristics of the study sample, and Figure 1 the flowchart of participants, from recruitment to final follow-up.

When assembling a paper for submission, it is usual to insert each table and figure on a new page after the reference list. The title of a table is usually presented at the top, whereas that of a figure is usually placed at the bottom. Check early whether the target journal requires submitting tables or figures as separate files and whether figures must have a specific file format (e.g., TIFF, JPEG, or PNG) to avoid unnecessary work.

2. What you should do

Make a deliberate choice early in the writing process on which data to present in tables and figures. Follow the target journal's instructions to the authors for drafting tables meticulously. Do not use them for what can easily be put into words. Create an informative title describing the content of the table, ensure a clear and attractive presentation of data, and explain all abbreviations in the legend. The legend is also useful for presenting the minimum/maximum values of measurement scales (making it easier for the reader to interpret values), or the level of statistical significance of the tests (usually marked with asterisks: $*P < 0.05$, $**P < 0.01$, $***P < 0.001$). Ask a colleague without knowledge of the study to explain the table to you to check its self-explanatory nature.

Avoid repeating all the information from the tables in the text, but stress the most important findings that support your hypothesis and those findings that are unexpected or otherwise remarkable. Keep the headings of table columns short (maximum of two lines) and place comparisons (e.g., between intervention and control groups) from left to right. Put your row headings into a meaningful order from top to bottom and indent subheadings for categories within a variable. For example, present results from the total sample above those of any subsamples. Present numbers in cells but their units of measurement in the column or row headings. Be consistent: use the same terms for important aspects (such as names of groups) in both text and tables.

Journals usually charge for colored illustrations, so unless you do not mind spending money on this, prepare black-and-white or gray-scale figures and check whether the scales are distinguishable after printing. When designing tables, use horizontal lines to mark the top and bottom and to separate the column headings from the body, but no vertical lines. Use landscape page format for wide tables. If you think of a table as a bookshelf, you do not want anything interrupting your eye movement from left to right.

Checklist for tables and figures

- Make a deliberate choice early in the writing process on which key findings to present in tables/figures.
- The title should reflect what is shown.
- Ensure that tables/figures are self-explanatory.
- Do not repeat information from tables/figures in the text but emphasize the important findings.
- Design tables/figures to make them clear and easy to read.
- Start each table/figure on a new page, after the reference list.

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Journal of Clinical Epidemiology

Effective writing and publishing scientific papers, part VIII: references

1. What you should know

Science moves forward by building on the research work of others, so it is important to appropriately cite previous work to acknowledge your sources, underpin your hypothesis, show that you are familiar with the relevant field, and give credit to the work of others, as well as avoid being charged with plagiarism. If you see your scientific paper as the spider in a large web, correct citations will allow readers to get an overview of the main work done previously within the field (the web). References can direct readers to supporting or diverging views and also to sources that may add relevant data to your work.

Organizing references can be time consuming. Most researchers work with reference management software, allowing them to organize, store, and download references of any type (scientific papers, books, web pages, and other publication types) at all times. Most of these programs support automatic importing of references from databases such as PubMed. Any references added to a citation manager can be easily inserted into the text of the paper. Word processor plug-ins enable automatic formatting of in-text citations and references lists using any of the many journal reference styles available from the citation manager software. This impacts on the way the citation is displayed in the main text (e.g., numbered or author–date), but also determines how the reference list itself will be shown (e.g., numbered, alphabetically, three authors, all authors, and so on). When pieces of text are moved around during revisions, the reference management software will automatically reorder the references. Papers that have been accepted but not yet published can be cited as "in press."

Since 2000, publications have been assigned digital object identifiers (DOIs) through CrossRef, a cooperative effort among publishers to enable consistent cross-publisher citation linking. The DOI for a document is permanent, whereas its location or URL may change. The DOIs are searchable through www.crossref.org.

2. What you should do

Choose your reference management program and always use it for references throughout your career. Find the output style of the intended journal in the author's instructions and choose that style when automatically formatting citations. If you cannot find the output style, choose the Vancouver style (recommended by the International Committee of Medical Journal Editors) or American Psychological Association style, which are nowadays the most common reference styles in biomedical research.

Make sure to acknowledge a source each time you describe a fact derived from that source. Importantly, go back to the original source. Authors quite often rely on references provided by other authors when citing papers, or they may use references to scientific work that described a fact (e.g., in the introduction), which was actually proved in a different paper. If you use a direct quotation, put the sentence in quotation marks. However, be very cautious about adaptations of full sentences. Take the information and use your own words, paraphrase, and summarize to avoid the charge of plagiarism. Do not aim to cite widely established facts; e.g., everyone knows that the sun rises every day. Never use footnotes; this is sometimes done in books, but not in biomedical journal articles.

Insert references that are relevant to the research question in the introduction and those that are relevant to the interpretation of the results in the discussion, although there may be overlap. Although you need to provide the readers with the underlying context and cite references to important work, some journals limit the number of references you can include (reviews and meta-analyses excepted). If you have several references that back up a specific statement, choose the one you think is most appropriate. Consider choosing the reference which (1) provides the highest level of evidence, (2) is open-access available, (3) has been most recently published, or (4) has been published in the journal to which you are submitting your manuscript. The latter will demonstrate to editors that you know and read their journal (which you should anyway, if you want to successfully publish with them).

Carefully check the reference list before submitting until you are sure that it is 100% correct. Reference software can be helpful, but it does not think for you and may make mistakes during formatting. Do realize that if your reference list is not up to high standards, editors and reviewers may also doubt the core of your paper or analysis.

Checklist for citing and references

- Use reference management software at all times.
- Find the requested output style in the author instructions of the target journal and adhere to it 100%.
- Always cite the original source behind a statement.
- Use your own words to describe facts derived from references, never copy paste sentences.
- If you need to choose among several references, select one by considering the level of evidence, open-access, year of publication, and published in the target journal.
- Meticulously check the final reference list for errors.

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WRITING TIPS SERIES

Effective writing and publishing scientific papers, part IX: authorship

1. What you should know

Being an author of a scientific paper—and having a key role as an author (first, second, last, corresponding, or guarantor)—can help your career. It is therefore unsurprising that authorship is a highly debated issue in meeting rooms and around coffee machines at academic departments. Authors must be distinguished from contributors based on *all* three criteria (see checklist) of the International Committee of Medical Journal Editors (ICMJE, www.icmje.org). Contributors who do not qualify for authorship can be listed in the acknowledgements (with permission), preferably accompanied by a statement of their contribution. Likewise, authors are usually asked to complete and sign both authorship and conflict-of-interest forms. In large multicenter studies, group authorship may be chosen, where the key researchers are listed as the leading authors, followed by "on behalf of the xyz group." The members of that group are listed in the acknowledgments but mostly identified as authors in search engines such as PubMed.

For biomedical journals in most countries, the first author is the most important position, followed by the last author (supervisor) and the second author. Some journals allow joint first authorship; this is usually indicated by a note in the author affiliation section. Many journals will also ask for one author to be identified as a guarantor and another as the corresponding author. The guarantor "takes responsibility for the integrity of the work as a whole, from inception to published article." The corresponding author is the primary contact person for questions related to the underlying work, during the editorial process and after publication. Often, both the corresponding author and/or the guarantor will be either the (junior) first author who ran the project or the (senior) last author who supervised it.

2. What you should do

Discuss contributions and authorship at the outset of a project and evaluate this from time to time. Most projects will produce multiple papers, and author roles can be different for each paper. The author team should preferably be unambiguous about who will act as the lead author for specific papers before the manuscript is initially drafted (see item on "how to get started"). Remember that people may shift careers, move to different places, or lose interest. It helps to have a core team of at most 2–3 people who typically make the day-to-day decisions in a project and who discuss authorship order as well. Consider preparing a written document describing the authors' roles, circulating it, and making sure it is clear that these agreements may be subject to change and renegotiation throughout the project. Preparing a written agreement forces a team to discuss what constitutes authorship and also explicitly sets out what the team thinks about factors that would change authorship or the order of authors throughout the project. Authorship gives credit where credit is due but also assigns responsibility to coauthors.

As a lead author, be aware that working with multiple coauthors requires planning. Prepare the primary draft with one other author. (S)he can also act as a backup when it comes to deciding on conflicting suggestions from other coauthors. Make this explicit when circulating the draft for critical review by all coauthors and preferably state what you expect from them: for example, general feedback on the draft or more specific comments on subsections. Be explicit in your communication as these expectations may differ between coauthors. Provide your coauthors with a deadline to respond and ask them to notify you when this is not feasible. Once a paper is off your desk, you cannot work on it. Hence, the planning of your project as a whole, and individual papers in particular, may be heavily affected by a nonresponding coauthor. On the final draft, ask the coauthors to meticulously check their names, including initials, titles, and affiliations. Misspelled names will appear in search engines such as PubMed.

Checklist for authorship

- Discuss authorship and develop a written authorship document (including lead authorship) at an early stage during a project.
- Check and follow ICMJE criteria on contributorship and authorship. Authors should have
  (1) contributed substantially to the conception and design, acquisition of data, or analysis and interpretation of data;
  (2) contributed to writing the paper or revising it critically for important intellectual content; and
  (3) given final approval of the version to be published.
- Ask coauthors to critically review and provide feedback with targeted questions and set them deadlines to respond.
- Ask coauthors to meticulously check their names, initials, and affiliations before submitting.

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Journal of Clinical Epidemiology

WRITING TIPS SERIES

Effective writing and publishing scientific papers, part X: choice of journal

1. What you should know

In a scientific paper, you try to tell a story, but to whom? Your audience will largely depend on the journal you publish your work in. PubMed alone cites more than 20 million papers. This shows that with some perseverance, you will probably get your paper published at some point, but choosing the right journal for your work is not easy.

Depending on a journal's status, space restrictions, and flow of submitted papers, acceptance rates vary from under 10% for the most prestigious journals to more than 80% for some journals. The impact factor of a journal reflects the average number of citations of articles published in the journal in the past 2 years and is a much debated but still widely used measure of a journal's relative importance in the field, published in the annual *Journal Citation Reports*. These also allow you to browse journals by subject category, which is useful to get an overview of journals within a specific field.

The number of electronic journals without printed formats is ever increasing. Such journals are not constricted by space limitations and will often be able to publish more papers a year as well as being able to publish papers very soon after acceptance.

Many scientific journals are nowadays (partly) open access. This is the practice of providing unrestricted access to and unrestricted reuse of peer-reviewed scholarly research via the Internet, so papers are also accessible to people who do not subscribe to the journal (eg, researchers not attached to an academic department or living in low-income countries), and materials may be used and copied, subject to proper attribution of authorship. Open access does not necessarily mean that the author must pay a publication fee on acceptance, although many journals (traditional and electronic) do charge such fees (€500–2,000), which are replacing the publishers' traditional business model of reader subscription fees. There have been reported cases of mock journals and fake publishers sending out e-mail invitations to submit papers, while only being interested in pocketing publication fees. Proper scientific journals will not normally send such e-mails. Be aware that electronic publishing does not automatically imply open-access publishing or vice versa.

2. What you should do

Think about a target journal before starting to write. The nature of the target journal will affect the skeleton of your paper in general and the introduction and discussion sections in particular (see the item on "How to start"). Discuss within your team the focus and preferred audience for this specific paper. Look at the relevant literature for your project to see where similar work has been published. Decide if you want to reach fellow researchers, health professionals, or both and draw up a list of general journals or more disease-specific or content-specific specialist journals. Be realistic about the likeliness of your paper being accepted by a top journal. Ask your (senior) peers for an honest opinion and also ask them about their experiences with journals' peer-review and publication processes in terms of punctuality and reasons for rejection or acceptance. Look at the journals' Web sites and author's instruction to see if a journal actually publishes the type of paper you intend to write.

Balance the desire to publish in high–impact factor journals with your preferred time to publication. Submitting a paper to a journal with a high rejection rate may give you useful reviewer reports but may also delay your publication process by several months as multiple submissions may be necessary. Once you hit the submit button, the paper will be off your desk for quite a while. If you want to publish in a specific journal, be sure to read the journal. Look carefully at the table of contents and the papers, and read editorials to learn about the scope of the journal and the editors' preferences.

Discuss relevant target journals, prioritize them and rank a final list of 3–5 journals. This will enable you to focus on your first journal of choice and adhere to their author's instructions, while also giving you a predefined strategy should the paper be rejected by the first journal.

Checklist for choice of journal

- Think about a target journal before you start writing.
- Consider the following journal characteristics
  (1) Basic vs. clinical research
  (2) Generalist vs. specialist journal
  (3) Traditional (printed) vs. electronic journal
  (4) Subscription access vs. open access.
- Balance the desire to publish in top-quality journals with the need for rapid publication.
- Consider, but do not be fooled by, impact factors.
- Draw up a prioritized list of 3–5 journals.

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WRITING TIPS SERIES

Effective writing and publishing scientific papers, part XI: submitting a paper

1. What you should know

Uniform requirements exist for papers submitted to biomedical journals (www.icmje.org). Moreover, each journal has its own specific requirements for paper, which can be found in the author instructions on the journal's Web site. Every journal has slightly different requirements regarding aspects like the maximum number of words, the reference style to use or whether tables and figures should be embedded in the paper or submitted separately. It is advantageous to be aware of such requirements at an early stage of writing because you want your coauthors to read, comment on, and accept these additional text elements.

The cover letter accompanies the submission of your paper and may be the first that an editor reads. Therefore, it should stress the significance of the paper for the field of research and the relevance to the specific journal. The cover letter also confirms adherence to the journal's author requirements and contains any additional information that may be of interest to the editor.

Most journals want you to suggest at least two or three potential reviewers for your paper who are experts in their field and will be able to provide an objective assessment of the paper. A journal may contact these but will often invite additional reviewers to receive at least two good-quality reviews. Some journals also specifically ask for nonpreferred reviewers, who in your opinion may not be able to provide an objective assessment of the manuscript.

A journal's online submission system will guide you through the submission process step by step. Well-prepared manuscripts can be submitted within an hour or so, but if you cannot finish the submission in one go, the system usually allows to save information and resume the submission process later.

2. What you should do

Ask yourself if you are fully satisfied with the manuscript. Have you taken sufficient time for reflection since you finished the last bits? Read your full manuscript carefully one last time, preferably after it has rested for a couple of days. Ask yourself: Is the story line obvious, logical, and interesting? Is the text clear but also concise? Have I been consistent in the use of terms? Is the language correct and are there zero typos left?

Consider having your manuscript proofread by a trusted peer. This is a researcher or a nonscientist with editorial experience who you know well, who has the basic scientific knowledge you would assume from the readers of the journal you are about to submit your manuscript to, but who has not been involved with your research study and writing of the manuscript. Such a peer is able to identify the "blind spots" in the manuscript, which you and your coauthors have overlooked and to give valuable feedback for final improvements of the manuscript. Furthermore, in case your mother tongue is not English, it can be useful to have your paper checked by a native speaker or a professional language editing service.

Use the cover letter as an opportunity to "sell your paper" to the editor, who will ultimately decide on it. Include the following basic elements. (1) Your request: to submit the paper (mentioning its title) for publication in the journal. (2) A summary of the paper's significance (in 2–3 sentences): which relevant problem it addresses, the main finding, and a message why this finding is important. (3) A statement of the paper's relevance to the journal's audience. A good reason would be that related work was published in the same journal earlier. Make sure that you cite that work as this shows your knowledge of and interest in the journal. (4) Any information required by the journal such as a statement that the material has not been submitted elsewhere or a statement about conflicts of interest. In addition to these basic elements, you can articulate specific issues related to your paper.

Once you have finished your submission, you should archive all information from the submission process. Monitor the status of your submission regularly and contact the journal if the status is unclear or when a decision is taking too long (eg, when you have not heard from the journal in 2–3 months).

Checklist for submitting a paper

- Read your full paper from beginning to end carefully one more time.
- Check whether you have adhered 100% to the journal's specific author requirements.
- Write a convincing cover letter including the following elements:
  - the paper's title and your request to submit for publication;
  - significance of the main findings for the field;
  - relevance to the journal's audience;
  - information required by the journal; and
  - additional issues related to the paper.
- Follow the steps of the journal's online submission system.
- Archive all relevant data from the submission.
- Monitor the processing of your paper by the journal from time to time.

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WRITING TIPS SERIES

Effective writing and publishing scientific papers, part XII: responding to reviewers

1. What you should know

There are three types of editorial decisions about submitted papers: acceptance, rejection (immediately by the journal's editor or after peer review), or revision (usually with peer review). Many published papers have been rejected and/or revised several times before being accepted. Receiving a "revise and resubmit" decision proves that a journal is interested, which is good news because it means there is a good chance of acceptation if you respond satisfactorily to the reviewers' comments.

Journals experience difficulties in obtaining a sufficient number (at least two) of high-quality reviewer reports in time. Such reports contain comments from the reviewer to the author (usually anonymously) and additional comments to the editor, which will not be forwarded to the author. Reviewers' comments and recommendations frequently differ from each other. Editors will use these reports to judge whether the findings reported in a paper are sufficiently substantiated, but they will also base their decision on their judgment about whether these findings are new and relevant to their audience.

A "reject after review" decision contains the reviewers' comments on the paper. A "revise and resubmit" decision contains the reviewers' comments and sometimes additional editorial comments. A well-written review is structured into "major comments," which you will definitely need to address in a revision, and "minor comments." Each comment ideally includes a clear point of criticism with reference to a specific part of the paper and sometimes a suggestion for revision (if possible). The revised version of the paper will be read and judged by the editor and may also be returned to the reviewers to assess whether comments have been addressed satisfactorily. Reviewers and editors may then ask for further revisions.

2. What you should do

Do not panic when receiving a "reject after review" decision! Be aware that papers are more often rejected than accepted. Reviewer reports will give you free advice on how to improve your paper. Once you have received the decision, read it, sleep on it, and read it again, reflecting on the reasons for rejection. Share the rejection decision with your coauthors, and use the opportunity to further strengthen your manuscript before submitting it to a different journal. Do not leave it too long, and motivate yourself to start this next submission as soon as possible. Be as careful with a new submission of your paper as with the first.

When receiving a "revise and resubmit" decision, read the report carefully and let it sink in before writing the response. Copy/paste all comments into a new document and respond to each comment according to the following structure: (1) author's response: briefly respond to the criticism and (2) changes to the paper: state whether and where in the paper you have made revisions. Indicate revisions to your paper in the present tense or past perfect, for example, "We now present data on […] in Table 1" or "We have added information on […] to the third paragraph of the methods section." In your revised paper, mark the text that has been changed since the previous version, for example, using the "track changes" option of your word processor. Circulate your responses and the revised paper among the coauthors, incorporate their feedback, and get their approval on the new version before resubmitting to the journal.

Always be respectful toward the reviewers in your response to their comments. Add a word of thanks to each reviewer for taking the time to suggest improvements and try to adhere to as many suggestions for revision as you can agree with. You can, however, also respectfully disagree with a reviewer's comment. Provide solid arguments to support your point of view, including references to evidence from your own data or previously published work. Some comments can be addressed in the author's response without making changes to the paper, in particular when there were no specific suggestions for revision by the reviewer. In any case, reviewers reading your response and the revised paper should get the impression that you have taken their comments seriously and that you have done your best to improve the paper accordingly. In the end, you will find that hoped-for e-mail in your in-box headed "accepted for publication." Cherish that moment and be sure to celebrate it!

Checklist for responding to reviewers

- Provide a point-by-point response to all reviewer comments, structured as:
  - author's response to the reviewer (in a respectful tone);
  - changes to the paper (whether and where).
- Provide a marked revision of your paper.
- In case of rejection:
  - do not get frustrated and motivate yourself to move on quickly;
  - improve your paper if possible, based on the reviewers' comments; and
  - submit the new version to a different journal.
- Get your coauthors' approval on revisions and resubmissions.

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LETTERS TO THE EDITOR

Effective writing and dealing with reviewers

To the Editor:

Effective writing is probably not supported by the following advice to your readers: after the rejection of an article that has been sent out for peer review, Dr. Kotz and Dr. Cals recommend: ''Once you have received the decision, read it, sleep on it, and read it again, reflecting on the reasons for rejection (…) and use the opportunity to further strengthen your manuscript before submitting it to a different journal'' [1]. This reasoning is part of the ''Icarus fallacy'': many people believe that medical articles improve after corrections by co-authors, further enhanced by suggestions from the professor, almost hit the jackpot after reviewers' comments, and ultimately get published in the Lancet. I cannot prove this statement, and neither can Dr Kotz and Dr Cals prove theirs. However, Icarus fell down because his wings were burnt by the sun's heat. And only a minority of medical articles are being published in top clinical journals. Dealing with feedback from reviewers after a rejection is a false feedback loop; they are not executive, and you do not know who they are. I got all my articles published.

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Reference

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Dr F.d.V. is an accredited trainer of a course on effective medical writing which has been developed by Tim Albert training, UK.

Authors should consider reviewer comments on a rejected article to improve their article before submission to the next journal

We thank Frank de Vries for his interest in our series on effective writing and publishing scientific articles [1], in particular part XII: responding to reviewers [2]. In his letter [3], De Vries specifically states that effective writing is not supported by our advice on what to do when a manuscript has been rejected with review by a journal: ''read it, sleep on it, and read it again, reflecting on the reasons for rejection. Share the rejection decision with your co-authors, and use the opportunity to further strengthen your manuscript before submitting it to a different journal'' [2].

De Vries finds this the wrong approach and states that dealing with feedback from reviewers after a rejection is a ''false feedback loop''. He implies that one should neglect the feedback from these, mostly unknown, reviewers and submit the manuscript unchanged to the next journal. We find this a rather negative attitude toward the peer review process as it suggests that peer review is not useful at all to improve the quality of scientific articles. Hence, we fully disagree with this viewpoint. The advice from our writing series is useful because a good reviewer report always contains suggestions, which, if followed by the author, will improve the quality of the article and subsequently increase the likelihood of acceptance of the article at the next journal. Furthermore, it may happen that the next journal will accidentally involve partly the same people into the peer reviewing process (as journals will always search for those researchers with the highest level of expertise and experience in the field, which may be only a few). If you can show that you have taken the feedback from the previous peer review round seriously, part of the job is already done.

The peer review process is not perfect and reviewers sometimes produce poor reports, but in many cases, peer reviews provide authors with objective, critical, and constructive feedback on their work [4]. For example, if two or more reviewers offer the same criticism, other future reviewers and editors are likely to share their response [5]. Ignoring such feedback shows disrespect toward those reviewers who spent their valuable time and expertise on

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helping to improve somebody else's article. The same goes for feedback and tips from co-authors. De Vries claims that the belief that an article will benefit from advice by insiders (co-authors and professors) and outsiders (reviewers) is an ''Icarus fallacy''. However, we believe that neglecting their advice is the *real* Icarus fallacy. Icarus was warned not to fly his artificial wings too high or too low to prevent them from burning by the sun or getting soaked by the water from the sea. He neglected the advice given to him, and his over-ambition led him to burn his wings and fall into the sea where he drowned. Effective writing and publishing is teamwork, and researchers should use their team to strengthen their work and also to realistically aim for the right journal [6,7].

Contrary to the advice by De Vries, our writing series [1] and writing course [8] teach researchers to become self-critical academic writers who are open for critical feedback from their peers. This, we believe, will lead to more effective writing and publishing by the individual researcher and to the advancement of science as a whole.

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References

[1] Kotz D, Cals JWL, Tugwell P, Knottnerus JA. Introducing a new series on effective writing and publishing of scientific papers. J Clin Epidemiol 2013;66:359–60.
[2] Kotz D, Cals JWL. Effective writing and publishing scientific papers, part XII: responding to reviewers. J Clin Epidemiol 2014; 67:243.
[3] De Vries F. Effective writing and dealing with reviewers. J Clin Epidemiol 2014;67:830 [in this issue].
[4] Spigt M, Arts ICW. How to review a manuscript. J Clin Epidemiol 2010;63:1385–90.
[5] Guyatt GH, Brian Haynes R. Preparing reports for publication and responding to reviewers' comments. J Clin Epidemiol 2006;59: 900–6.
[6] Cals JWL, Kotz D. Effective writing and publishing scientific papers, part IX: authorship. J Clin Epidemiol 2013;66:1319.
[7] Cals JWL, Kotz D. Effective writing and publishing scientific papers, part X: choice of journal. J Clin Epidemiol 2014;67:3.
[8] Effective writing and publishing scientific papers. Available at www.heuvellandcursus.nl. Accessed March 17, 2014.

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A stepped wedge cluster randomized trial is preferable for assessing complex health interventions

To the Editor:

The stepped wedge design, a form of cluster randomized controlled trial (CRCT), presents advantages and disadvantages, as previously debated [1–3]. Under certain circumstances, this design facilitates the implementation of complex health interventions [4].

The assessment of complex health interventions imposes some constraints. First, because professionals must be trained in the intervention, cluster randomization of professionals belonging to the same network of care is required to prevent contamination bias. Second, the availability of professionals for inclusion of patients may be adversely affected at certain periods of higher workload. To avoid clusters with no inclusion and to avoid the risks of inter-cluster contamination, it is consequently preferable to have a limited number of clusters, with each one containing a high number of professionals. It is therefore difficult to use a classic parallel CRCT design in this context, because this would often require a high cluster number. A classic crossover design is, meanwhile, impossible to use, because the training of the professionals could not be undone.

The choice of a CRCT stepped wedge trial can be advantageous [5]. First, the intervention is introduced sequentially in the order assigned by randomization, with only some professionals trained simultaneously at each time point, which can facilitate intervention implementation. Second, the stepped wedge design has recently been shown to be far more efficient than a parallel CRCT design in terms of sample size [6]. The intervention effect can indeed be estimated using between- and within-cluster comparisons. Consequently, fewer clusters are needed than with a parallel CRCT design, which can improve group comparability in terms of population characteristics. Another reason that the comparability of groups is improved is that the professionals are their own controls in both control and program units.

A stepped wedge design could also present some disadvantages [1] such as the potentially burdensome nature of repeated measurements of variables, the longer time generally required compared with a classic CRCT design, and the risk of providing an intervention of not yet proven efficiency to a large number of patients.

On the contrary, to avoid the burden of repeated measurements, new patients can be sampled from the clusters at each measurement. Also, if each patient is included for a short period of time, the total duration of the study could be no longer with a stepped wedge design than with a classic parallel design. Only the professionals all receive the intervention by the end of study; this means that if the intervention turns out to be ineffective,

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