

SPECIAL REVIEW ARTICLE

How to Write a Successful Article

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Abstract

In this report, several issues relevant to scientific publishing in the field of medical imaging are described. How the quality of the research in medical imaging is evaluated is presented as well. The need for journals and the role of current metrics to judge the quality of articles and journals are discussed. Several recommendations are given to aspiring authors on how to write scientific articles in this field to help them optimize their chances of having their articles accepted. Recommendations on how to effectively deal with the review process and how to properly communicate with scientific journals are offered in order to facilitate authors' interaction with reviewers and editors of the journals in the field.

Keywords: Medical imaging articles, Review process, Scientific articles

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General considerations: The process of scientific publishing, scientific integrity and imaging research

We live in an era of scientific publishing. Scientific publishing has made results of scientific research accessible to the larger public and provides a basis for reliable scientific communication on a global scale. In order for it to be accessible, research must be published, if possible in the most prestigious journals. This requirement puts considerable pressure on universities, health care centers and, in particular, individual researchers, who are often confronted with the painful dilemma known as “publish or perish”. They must publish the results of their research or risk perishing due to lack of recognition, funding, etc.

Scientific publishing should be founded on scientific integrity and adherence to professional values and practices when applying the results of science and scholarship. Scientific integrity also demands objectivity, clarity and reproducibility of data in order to enhance clinical value. Furthermore, scientific integrity is important to preventing bias, fabrication or falsification of data, plagiarism, outside interference, censorship or other unfavorable influences.

When it comes to publishing scientific research in medical imaging, it is important to note that there are specific issues that sometimes may be difficult to address. There are also ethical issues that may influence the design of imaging studies.

For example, in some cases, conducting randomized placebo-controlled trials may be considered unethical as the best imaging test may be denied to a given groups of patients. Observational studies may address this problem to some degree when we evaluate imaging tests. On the other hand, large prospective randomized, controlled double-blind trials are considered the “gold standard” for comparative imaging studies. However, such studies are complicated and expensive, requiring funding by industry, which may be difficult to secure for individual imaging departments. Furthermore, analysis and final publication usually take several years once such trials have been conducted.

For high-quality research on the value of imaging tests to have an impact on evidence-based guidelines and diagnostic strategies, publication in peer-reviewed leading journals is required. As a rule, such first-rate published studies in medicine are scrutinized by health technology assessment agencies and other bodies using systematic reviews and processes that may be difficult to apply to medical imaging research. For example, the Quality Assessment of Diagnostic Accuracy Studies (QUADAS) criteria (1), typically used for assessing the quality of research studies in medicine, require a well-defined reference standard. Such a reference standard often consists of histologic confirmation, which often is not possible in imaging studies (e.g., one cannot biopsy every site

with positive ^{18}F -FDG uptake). Similarly, the reference standard should be acquired by a test that is independent from the index test. Doing this is not possible in imaging research as one can take biopsies only from positive areas on the images. Also, the patients should receive the same reference standard regardless of the index test result, which is again not possible for an imaging test assessment. It is difficult to apply QUADAS criteria or other criteria used to assess the quality of research studies in medicine to imaging research. The bottom line is that published imaging studies are often discarded from evidence-based guidelines because they comply only partially with the required criteria.

Once research has been published, who evaluates the impact of the research publications? The Institute for Scientific Information's (ISI) "impact factor" has dominated the metrics regarding quality of scientific journals for many years (2), with Thomson Scientific, part of Thomson Corporation, enjoying a monopoly of scientific citation reports. Currently the Journal Citation Reports in the Web of Science are provided by Clarivate Analytics. Such private companies may have a vested interest in what is evaluated and in the results of the evaluation. However, new systems and figures to evaluate the quality of research and the performance of scientific journals are rapidly emerging. It will take some time to understand all of these new tools properly. Academia and companies will keep producing more sophisticated and more efficient citation metrics to assess scientific quality. Most likely the simultaneous use of various indices will provide a more balanced estimate of scientific quality than does the impact factor alone. Whether these metrics should influence decisions on where to publish, or even whom to promote in rank or to hire in academia or industry, must be the subject of further debate within the scientific community.

The journal's point of view

For an author, it is important to understand the point of view of the scientific journal. Currently, all scientific journals publish (and compete) at a global level. The metrics used to assess the impact and quality of the journals compare all existing journals by category at the same time. On the other hand, scientific journals, including those devoted to medical imaging, receive submissions from all over the world every day around the clock. Often the large number of submissions for publication exceeds the number of manuscripts that a single journal can publish. Furthermore, as the impact factor of a journal in a given year is the number of citations of its articles published in the previous two years divided by the number of papers published in the same period, all journals try to keep the denominator in this calculation (number of articles published) as low as possible. The pressure regarding impact factor and other metrics along with the high numbers of

articles received often results in high rejection rates.

In addition, all journals strive to offer a rapid and balanced peer-review process, which is determined by the willingness of peers to review the research of their colleagues. Although this system is not perfect, it has stood the test of time and remains the standard way of judging research prior to publication. Authors must understand that, with time, they will most likely become reviewers too and will have the chance to judge the quality of research produced by others and to help them improve their manuscripts and eventually publish their research.

What to keep in mind during the process of preparing and submitting an article

1. Before submitting the paper to a scientific journal

Ensure that the manuscript has a clear and logical message. The paper can be either clinically or technically oriented but, however careful and beautiful the presentation, the paper will not be accepted for publication unless it has a clear message with a sound conclusion. The recommendation is that you make sure you have something important and publishable to say (new, true, clear, relevant, etc.). Discuss the originality and importance of your idea, the value of your findings and the relevance of your main message with other colleagues or with your mentors, both in your institution and elsewhere. Such discussions prior to writing the manuscript will help you to understand how can you best design and structure your paper and formulate your conclusions.

2. Writing the draft

The next step is to prepare a first draft, describing the hypothesis and objectives of the study, with description of the methods employed, including the results with figures and tables, and a draft discussion. Then you should repeat the consultation process. Ask people whose work you respect if they find your data valuable, and ask them which journal they think would be most appropriate to submit to. If the paper is clinically oriented, it would be better to submit to a clinical journal, while a technically oriented paper might be better received by a technical journal.

Once you decide on a journal, be aware of which journals are publishing papers similar to yours, and ensure that your article fits well within the scope of the journal. Make sure that you read thoroughly the journal's editorial policy and guidelines to the authors and note which people in your scientific field are on the editorial board since you may propose them as potential reviewers for your manuscript.

Use a compelling title for the manuscript. The importance of a good title is often overlooked. The title should always indicate the main message of the manuscript. Remember that articles with short titles are more often cited than articles with

long and wordy titles. If you stay simple and concise, you are more likely to be cited. Avoid negative statements and acronyms in the title whenever possible. Titles that are too long and complicated may not be well received by the editor and the eventual reviewers.

When writing the draft, always try to avoid long texts. Journals usually have page limits. Short papers are more likely to be read than long ones. Do not use too many references and, if possible, try to include a few from recent issues of the same journal. Remember that the citations from the journal that you include in the paper will be taken into account for the impact factor of the journal, which is always appreciated by the editor.

Choose adequate keywords. This choice is not trivial since such keywords will be used to cite the article and may be used to select reviewers for the paper. Journals have big databases of potential reviewers, and often automatic systems select the ones who match your indicated keywords and offer them to the editor.

3. Abstract section

The abstract is an essential part of the manuscript as it is what the editor and reviewers read first. Therefore, the abstract will make the first impression on the editor and the reviewers, and of course this first impression matters. Furthermore, reviewers typically take on or decline a review based on their reading of only the abstract. Only after they have agreed to perform a review does the system give them access to the full contents of the manuscript.

When writing the abstract be concise and use short sentences. The abstract must be self-explanatory. Structure the sections in the same order as the manuscript (aim, methods, results, conclusion), using separate paragraphs. Summarize the methods and results. Do not include discussion in the abstract unless essential for the message of the paper. Stay consistent with the contents of the manuscript, and word the conclusion in the same way as in the article.

A good abstract must be reader-friendly, and the paragraphs should be well structured and balanced in length, making the abstract visually appealing. Do not use acronyms or abbreviations unless absolutely necessary as they make the abstract difficult to read. Use full spellings and do not include too many numbers or decimals unless necessary. Try to end the abstract with a compelling sentence that conveys the main message of the manuscript.

4. Introduction section

This section should not be too long. Be concise, and remember that your article is not a review article. Often authors try to make extensive review of the subject in the introduction section. You do not need to demonstrate your knowledge of the subject in this section. What is most

important is that you justify the need for your paper. Indicate the problem you intend to address and explain the purpose of the research you have conducted. Avoid using new acronyms. Authors often believe that this will help to shorten their paper, but they will simply confuse the readers. Do not include too many references in this section; cite just the ones you deem essential to justify the need and importance of your work.

5. Methods section

In this section of the manuscript, it is important to avoid descriptions of the methods employed that are too extensive. When describing the methods employed, stick to what is new or innovative in your article, which you may explain in detail.

Otherwise, if you have used methodologies previously described or employed by others, use appropriate references instead of the full descriptions.

6. Results section

It is important that the results section be as self-explanatory as possible. A reader should be able to understand your paper by reading the results section only. Use the necessary figures and tables properly referred to in the text and well inserted into the narrative of the section. Make sure that your graphs and tables can speak for themselves and are, again, self-explanatory. Do not duplicate in the text the information and numbers that already appear on the tables; however, keep in mind that too many figures or tables may make your paper less clear and straightforward.

Avoid case descriptions in the results section. Using these may detract from the strength of your manuscript. There are specific journals or article types for case reports. Although you can use images of given cases to illustrate your findings, try to stick to group results only to strengthen your message.

7. Discussion

A frequent mistake is to include extensive review of the subject in the discussion section. There are review articles for such a purpose. For your article to be an original research article, you need to stick to your own data only and discuss what is new or different from that of others.

In this section, you should answer why you obtained the observed results. Compare your findings with the ones from other authors and discuss the differences encountered. Emphasize why your findings are important and why they may be clinically relevant. Try to put them into clinical perspective. This is particularly important if you are submitting to a medical or clinically oriented journal.

8. Conclusion section

In this section you should not speculate. Stick to your findings and use concise but compelling wording to

summarize what you have found and to indicate the message of the manuscript. Proper wording of the conclusion section is key to the success of the manuscript. Finally, remember that this section should match the conclusion section of the abstract.

9. Submitting your paper

Carefully prepare the final version according to the journal's instructions. Recommendations regarding language and style have been given elsewhere (3). Pay attention to all the requirements for online submission. Make sure to fill all fields and to upload all the necessary files. When your submission reaches the editorial office, the first filter will be an administrative check for appropriateness of all files. Any error detected at this point may delay and detract from the review process.

Prepare a clear and concise cover letter. The importance of such a letter cannot be overlooked as it will be the first thing the editor will read. Include a brief statement, in a sentence or two, indicating why you think the paper is important and why the journal should publish it. It is recommended that you keep the cover letter as short as possible since the editor probably receives many papers and will find it easier to assess yours if you stay concise.

Always disclose any source of potential conflict of interest and any financial support received for the study.

During the submission process, journals often give authors the opportunity to indicate preferred and non-preferred reviewers. Always take advantage of such an opportunity to help in the selection of appropriate reviewers for your article. When you list those preferred, include a brief explanation of why they would be appropriate reviewers, in particular if they have previously published on the same subject. Be sure to reference these individuals in your manuscript. The reviewers will appreciate seeing themselves cited in your article. When you list those you would prefer not to have selected as reviewers, include a brief explanation of why they would not be appropriate reviewers for your work, indicating potential causes of bias or conflict that might preclude objective review.

When your paper has been submitted, the journal will acknowledge receipt. If you do not hear anything from the journal in a couple of weeks, email the editorial office and ask for an acknowledgement of receipt, a reference number, and the name of the associate editor who is handling your submission. Use the reference number in any subsequent correspondence.

10. The journal's response and types of decisions

After the administrative check, most journals now use systems to assess papers for similarities with previously published material. This is done to identify duplications or to

prevent eventual plagiarism. Such systems continuously search the web for similar paragraphs and identify texts that are identical or similar to the ones in the submitted manuscript. In general such systems give a percentage value of similarity, which over a given threshold makes a paper unacceptable. Obviously some degree or percentage of similarity within articles that address the same subject or use similar methods is unavoidable. Therefore similarity results of lower than 15% are generally considered acceptable.

After this check, the editor will assess your manuscript and will make a first decision. If your article does not fit within the scope of the journal, or the editor has had many submissions on the same subject, your article may be declined at this point. Alternatively, the editor may suggest that your article be submitted to another journal that may better accommodate your paper.

Articles accepted for consideration will be sent out for review. Remember that the editor may select the reviewers according to your keywords, taking into account your preferred and non-preferred reviewers and which of the journal's editorial board members that may have expertise on the subject of your paper. Once the reviewers have returned their reviews, the editor will make his or her decision. The article may be accepted without further revision, which is currently very unlikely. More often a revision may be requested, which may be major or minor, or the article will be rejected at this point.

11. Reacting to the journal's response

When the journal has assessed your paper, the editor will write to you with a decision about publication, including the reviewers' reports. Read the decision letter and the reviewers' comments carefully. Sometimes the editor's letter will be clear, indicating how you should revise your paper for resubmission. If the letter is not clear, reply to the editor explaining what you do not understand, and ask for an explanation (for example the reviewers' comments may be difficult to understand). If you have received many or very strong criticisms but the editor is asking for a revised version, do not react negatively to such criticisms or be angry with the reviewers' comments.

Remember that the reviewers feel that your paper is still valuable and may be re-considered for publication. They will most likely suggest the lines along which the article should be revised and potentially strengthened in order to produce a positive decision.

12. How to prepare a revised version

Try to modify your paper along the lines suggested by the reviewers, addressing all comments and issues raised in the review process. Try to stay positive and constructive,

remembering that the reviewers felt that the manuscript could be improved and might finally deserve publication. Do not make changes other than those that were requested by the reviewers, as doing so may complicate the re-evaluation process.

Prepare a detailed point-by-point response to the reviewers' comments. This may be the most crucial part of the re-submission process. The editor and the reviewers will judge the appropriateness of your revision according to this letter. Therefore the order, the structure and the wording of the letter are key for a final positive decision. Indicate in detail what changes were made in the revised version and why. Do not hesitate to explain what comments were not considered appropriate and therefore did not result in any change in your paper. Always stay brief, clear and concise while responding to all commentaries by the reviewers. Highlight the changes made in the revised version of the paper that you upload to the journal's online system. Doing this will help the re-evaluation process. In the cover letter to the editor, clearly indicate that you have addressed all issues raised in the review.

What to do if your paper is rejected

If a journal finally declines to publish your paper, it is a good idea to discuss this decision with colleagues in the field, showing them the reports and decision letter before proceeding further. It might be worth appealing the decision, or it might be better to submit the paper to another journal. If you decide to appeal, send a letter stating your case, and stick to scientific points. Do not send angry or abusive letters, as doing so will not help your case. In the current era of scientific publishing it is difficult and highly competitive to get your articles accepted in high ranking journals. Never take the journal decisions personally or emotionally. Remember that journals receive a very large number of manuscripts and they need to assign priority for publication on various grounds. If your article was not accepted it does not mean that yours is poor science but simply that it was not possible this time to accommodate your paper. You may succeed with this paper in another journal now, and you may succeed in this journal with another paper in the future.

What to do if your paper is accepted

If your paper is accepted for publication, ask the editorial

office immediately about the journal's policy on copyright and reprints. Handle the proofs rapidly to avoid any potential delay in publication. When you are given a publication date for your paper, tell your institution so that it can include this information in its annual report or other documents promoting its research. Thank personally all those who have helped you in preparing the paper, letting them know that it will be published and in which journal.

Conclusion

What has been provided are recommendations on how to properly prepare a manuscript and how to effectively communicate with reviewers and editors of medical imaging journals. The road to publication in a scientific journal is long and winding, but getting an article accepted by a high ranking journal is always a rewarding experience.

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Conflicts of interest

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