

A Brief Guide to Reviewing a Scientific Paper

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Thank you for serving as a reviewer for TRANSFUSION! Your peer reviews contribute immensely to the scientific quality of the journal. What follows is a brief guide to reviewing. It may be most useful to individuals new to performing peer reviews—feel free to share it.

When Should I Decline a Review?

After reading the title and abstract, you should decline an invitation to review if:

1. The topic falls outside of your scope of expertise, or
2. You cannot do the review in the allotted time, or
3. You have a conflict that would preclude you from judging the manuscript fairly.

If you need to decline a review within your area of expertise, please suggest an alternate reviewer to the Associate Editor. Otherwise—with the gratitude of TRANSFUSION’s editors and staff—hit “Accept”, download the manuscript, and set aside time to do the review.

The Four Questions

When reviewing a scientific paper, ask yourself:

1. *What is the question the investigators want to answer?*
2. *Is the question important?*
3. *How was the question answered?*
4. *Are the conclusions supported by the results?*

Let us consider these individually.

1. *What is the question the investigators want to answer?*

Every scientific paper should present a question and describe what was done to answer that question. (A research question¹ is distinct from a hypothesis, which is a provisional, testable *answer* to a question.) As a reviewer, step one is to understand the question driving the study. A well-written Introduction should make this easy.

2. *Is the question important?*

Whether a question is important or interesting is subjective, but that is why you as an expert were asked to perform the review. Given the medical focus of TRANSFUSION, you should consider a study’s potential clinical impact. But many important studies have zero impact on patient care. Their importance lies instead in increasing our knowledge or improving our understanding. You should also consider a study’s novelty . . . recognizing that some studies are valuable because they confirm earlier work.

3. *How was the question answered?*

Read the Methods and ask yourself:

- Could the study as designed answer the question?
- Does the Methods section clearly explain what the investigators did?
- Is enough detail provided so that someone else could reproduce the study?
- Are experiments repeated sufficiently / is the study adequately powered?
- Are statistical tests used appropriately?
- Are there any ethical issues?

I like Neil deGrasse Tyson's definition of the Scientific Method: "doing whatever it takes not to fool oneself into thinking what's true is false, or what's false is true."² It is easy to be tricked into thinking that because A is associated with B, then A must cause B. Strong investigators try to imagine every way that they might be misled about a result. **A scientific result is only as strong as the controls that were done.** Whether reviewing a basic science or clinical study, consider experimental controls carefully. Ask yourself:

- Do the controls permit the results to be interpreted?
- Were any important positive or negative controls left out?

All important data are highlighted in the Results section and presented in Figures and Tables. Ask yourself:

- Are the Figures and Tables easy to understand?
- Are any Figures or Tables unnecessary?

Great Figures and Tables can stand alone—they are comprehensible without even reading the paper. If a Figure or Table is confusing, suggest ways to make it clearer.

4. Are the conclusions supported by the results?

At the beginning of the Discussion, the investigator should state the answer obtained to the research question. After that, the Discussion typically focuses on interpreting the results, putting them into context, and commenting on the next questions to explore. Ask yourself:

- Are the conclusions justified based on the results?
- Do the authors consider alternative interpretations that are also justified by the results?
- Does the scope of the conclusions match the scope of the results?
- Do the authors discuss limitations of the study?
- Should any key articles be added to the References?

Final Thoughts

- A thoughtful review can make a scientific paper much better.
- Think critically, comment constructively. When pointing out flaws in a paper, even fatal flaws, using constructive language is both kind and helpful to the authors i.e. "this manuscript would be improved by . . ." If you were to receive a negative review, how would you like it to read?

- Don't waste time on typographical and grammatical errors. Focus on the science. It is sufficient to say something like, "There are numerous grammatical errors throughout; this manuscript would be improved with substantial editing."
- Remember that manuscripts under review are confidential. Do not share the findings with anyone until after the paper has been published. (Feel free to involve a trainee or bounce ideas off a trusted colleague when reviewing a paper, just make sure that they understand the need to maintain confidentiality.)
- To learn more about being an expert peer reviewer, you may be interested in these resources:
 - The free online course by Publons: <https://publons.com/blog/publons-academy/>
 - Heddle NM and Ness PM. Reviewing manuscripts: tips and responsibilities. *Transfusion* 2009;49:2265-2268.

A Good Review Format

Confidential Comments to the Associate Editor

Use this section to tell the Associate Editor if you think the paper should be accepted, rejected, or revised, and why. Will this paper interest the TRANSFUSION readership? Do you have any ethical concerns?

Comments to the Author

General comments

Briefly summarize the question that was asked, and the approach taken to answer the question. Briefly summarize the key results.

Provide your overall assessment of the study. How well was the study designed to answer the research question? Do the data support the conclusions? Explain your major concerns. Please do *not* indicate in your Comments to the Author whether you think the paper should be published.

Specific comments

1. Starting with the Title, followed by the Abstract, Introduction, etc. . . .
2. Provide numbered specific comments sequentially.
3. Provide page and line numbers with each comment.

Acknowledgments

I want to thank these trusted colleagues for kindly reviewing and contributing ideas to this guide: Donnie Arnold, Beth Shaz, Nancy Heddle, Mark Yazer, and Jim Zimring.

References

1. Heddle NM. The research question. *Transfusion* 2007;47:15-17.
2. <https://twitter.com/neiltyson/status/225648867700514816?lang=e>