Writing a research paper: Part 1

Tips for writing a research manuscript efficiently and completely
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Introduction

Peer-reviewed academic journals publish a variety of article types, such as "research articles" that report original research, "reviews" of the literature, and "case reports" of a small number of interesting cases. Each article type has its own specific format, and it is important that you use the appropriate one.

This booklet provides tips for how to write original research articles. These articles are sometimes called Research Papers, Original Articles, Original Papers, Research Reports, Short Communications, Research Communications, Brief Communications, and Brief Notes — and there are many other variations.

An infographic that summarizes the information in this booklet is also available at: https://www.edanzediting.com/sites/default/files/edanz_infographic_imrad_0.pdf

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Know IMRaD

Original research papers usually use the IMRaD formula. This acronym includes the four main sections of a research paper (Introduction, Methods, Results, and Discussion), which answer four basic questions, as shown in the Box.

According to the International Committee of Medical Journal Editors (at www.icmje.org), the "[IMRaD] structure is not an arbitrary publication format but a reflection of the process of scientific discovery."

The full structure is actually TA-IMRaD-RAS, because research papers begin with a Title and Abstract, end with the References, and often also have an Acknowledgment and various Statements. Some features of these additional sections are shown on the next page.

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Title: usually part of the submitted Title Page, which also contains authors’ details and often the word count and number of illustrations (tables and figures)

Abstract: a summary of the study with or without subheadings such as Introduction, Methods, Results, Conclusion; usually ends with key words

References: two commonly used styles are numbering in order of appearance (Vancouver) and alphabetical by surname and in date order (Harvard); the style and the position of the reference list depend on the journal

Acknowledgment/s: here, you thank people who do not qualify for authorship but who helped you with the research or its analysis, reporting, and presentation

Statements: declarations of, for example, work contributed by each author, funding source/s, conflicts of interest (reasons for any perceived bias), ethics approval, whether the data can be accessed by others, any supplementary methods/results files online, and whether any of the work has been previously presented; these declarations are sometimes made on the submitted Title Page and may appear at the beginning or end of the published article
Find a target journal early

Refer to the author guidelines of your target journal early on in the writing process. These guidelines explain the journal’s requirements for manuscript preparation, for example:

- Word count of the main text
- Word count and format of the abstract
- Variations of IMRaD structure:
  - Methods may be at the end or combined with Results
  - Results may be combined with Discussion
  - Methods, Results, and Discussion may all be one section

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Edanz Journal Selector

- Using the secure Edanz Journal Selector (at www.edanzediting.com/Journal-Selector) will help you find a suitable journal and its online author guidelines

- IMRaD section names (for example, Introduction, Background, or no heading for the first section of IMRaD)

- Extra sections: some journals require a Literature Review or Related Work section between the Introduction and Methods section; some require Conclusion and Future Work sections after the Discussion

- Number and style of references

- Number and formatting of illustrations and associated text, and placement of illustrations within the main text, at the end, or in separate files

- What statements to include and if there are special online forms to complete

- General formatting (such as double line spacing)

- UK or US spelling

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Use the “write” order

To increase your writing efficiency, use **TA-MRDI** order (Title, Abstract, Methods, Results, Discussion, Introduction) instead of **TA-IMRaD**. Otherwise, you may waste time at the start by writing an Introduction that is too long or unrelated to the rest of the paper.

The “write” order of **TA-MRDI**, with the Introduction written at the end, will allow you to build a focused academic argument and help convince the reader of the need for and importance of your study.

The recommended order for writing your research paper is actually based on your illustrations and can be summarized in 10 steps, as shown on the next page.

[Image of a person writing at a desk]

[Checklist for writing a research paper]

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1. **Preparation:** Draft your illustrations, put them in a logical order, and summarize each illustration’s key point. Use the key points and notes from your initial reading to make a brief IMRaD outline to answer the questions: Why did you do the study? What did you do? What did you find? What does it all mean?

2. **Title:** Announce the most important feature of your research

3. **Abstract** Summarize the key messages of your IMRaD outline; input text into the Edanz Journal Selector (www.edanzediting.com/Journal-Selector) to find a target journal

4. **Methods** Describe the materials/samples, procedures, and analytical methods in the order of your illustrations to allow others to repeat your study

5. **Results** Finalize your illustrations and highlight their main features in the main text

6. **Discussion** Evaluate your results in the context of the published literature, identify strengths and weaknesses, draw conclusions, and include implications and future directions

7. **Introduction** Present enough information for readers to understand your study’s aim, design, conclusions, implications, and importance; the amount of background depends on the target journal readership (for example, generalists versus specialists)

8. Prepare the **References** and any **Acknowledgment/s** and **Statements**

9. **Finalize the Title**

10. **Finalize the Abstract**
Advantages of using the “write” order

The “write” order of TA-MRDI will allow you to save time and start writing even while you are still performing the research. As soon as you have analyzed your results, prepare the illustrations and make sure they have corresponding descriptions in the Methods section of the main text. The Methods are factual, recent, and familiar to you, so they should be relatively easy to describe.

In the main text of the Results, you highlight the main features of your data and illustrations, making sure to describe relationships between the data instead of just repeating what is already shown in the illustrations.

In the Discussion, you compare your findings with those already published, and you identify strengths and weaknesses of your research. In this way, you evaluate your results in the context of what is already known in your field, and you can draw conclusions and propose practical and conceptual implications and future research directions.

While you read the relevant literature, you can decide which published articles will help frame your research in the Introduction, especially if your study design and data are of a higher quality than those in the literature. After writing the Discussion, you will also have a clear idea of the key findings, variables, concepts, theories, and topics that need to be explained to the reader in the Introduction.

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Conclusion

Complying with the author guidelines of your target journal and being familiar with IMRaD and the “write” order of TA-MRDI will help you prepare your manuscript efficiently and completely. By writing the Introduction after writing the Methods, Results, and Discussion, you will be able to provide readers with a logical and convincing rationale for your study and help them to understand the relevance and usefulness of your findings.

Finally, after drafting your manuscript, remember to revise, edit, and proofread your manuscript!

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