

The Logical Structure of a Research Paper in Clinical Healthcare

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The goal of this article is to provide an easy-to-follow guide, a template, for writing a research article in clinical healthcare. We will discuss each of the main recommended sections of the paper in turn, following the basic – and familiar – IMRAD¹ article structure, but with modifications specific to clinical research.

Let's start off by thinking about clinical research. Why is this kind of work different, distinct, to other kinds of academic, especially scientific research? There are several reasons. Clinical research is often conducted at a faster pace and also (for obvious reasons) needs to be published quicker. Doctors and other clinical researchers are almost always extremely busy, juggling a range of different responsibilities at the same time as well as developing and writing up their research. This is why templates and structures in academic writing can help.

The medical, healthcare and clinical literature is also vast. Large numbers of new papers are published each year – more than 180,000 papers in 2019 alone (that's more than 2,000 each day). We therefore need to develop ways in which we can both speed up this process and make the papers that we write more memorable, easier to read, and effective. This is also one of the goals of this article.

This article briefly outlines the logical structure of an academic research paper, starting with effective Titles, Keywords, and Abstracts and then moves to a description of the IMRAD main text structure. The goal of this article is to help you to increase your chances of publication as well as increase the impact of your research by producing a well-written and effective academic article more easily.

In general, a research paper should not just be a “scientific report” which states what was done, and presents the results obtained and their interpretation. It should capture the reader's interest, and have style

and flow with each section interconnected. It must tell a coherent and interesting story.

1. Readers are key in academic publishing

Sadly, when many academics start the writing process they don't think about their readers. People tend to write papers for themselves, or with their research group in mind. This is a mistake. The most important people in the academic publishing process are readers, be they editors, peer reviewers, or colleagues and other researchers who will actually cite and use academic articles. Think: What will your critics be assessing when they look at your work? What will be the key ‘take home’ messages? Who will be your harshest critics? Journal editors? Peer reviewers? Colleagues in your own department? Actually, they are all three.

The first thing that happens to an academic article when it is submitted to a journal is Editorial Triage. An editor will decide, based usually on just your Title, Abstract, and Cover Letter, whether, or not, your paper is ‘good enough’ or of ‘sufficient interest’ to the journal to be sent out for review. Is your paper going to pass this ‘triage’ stage and even be sent for peer review? Remember that many high impact academic journals also have high rejection rates, up to 90% in the case of *Nature*, *Science*, *The Lancet*, and *The British Medical Journal* (to name but a few).

Journal editors will be thinking: Is this paper suitable for our journal? Will it be downloaded and cited? Editors assess article suitability. Peer reviewers, on the other hand, tend to think: Is this study important for the field? Are the data and interpretations trustworthy? Always remember that the main reason academic articles get rejected is because of perceived issues in the Methods section (something we will discuss later in this article). The

¹ IMRAD = Introduction, Materials, Results and Discussion.

main role of a peer reviewer is to assess an article's credibility.

In contrast, peers in your field (your key readers once an article is accepted for publication, or is placed onto a preprint server) are thinking about how your work impacts them and how they can build on and use your work. Your readers expect both subject area and technical expertise. Demonstrating both is critical if your work is to pass through peer review successfully. You must use your manuscript to demonstrate both subject area and technical expertise.

With these issues in mind, it's important to guide your readers through your article. We will discuss how you can do this in this article. Your Introduction should provide context by discussing existing

information on a topic and defining the goals of the work, whilst your Figures, Tables and Results should present the new information relevant to the question addressed by your research. Finally, your Discussion and Conclusions should synthesise your new information in order to emphasise the value of your study to your field and make firm conclusions.

It is actually often easier for clinical researchers to do this than for workers in other academic disciplines because of the presence of reporting guidelines that colleagues should follow when writing and publishing. These include the equator network as well as the CONSORT checklist for randomised clinical trials, the STROBE checklist for observational studies, the PRISMA checklist for systematic reviews and the CARE checklist for case reports (Table 1).

Table 1 Resources that can be used to structure clinical research papers.

Checklist/resource	Link URL
Equator Network	www.equator-network.org
CONSORT	www.consort-statement.org/media/default/downloads/CONSORT%202010%20Checklist.pdf
STROBE	www.strobe-statement.org/?id=available-checklists
PRISMA	prisma-statement.org/prismastatement/Checklist.aspx
CARE	www.care-statement.org/checklist

2. Before starting to write

2.1. PICO checklist

It's very important to take a step back before starting to write to think about and plan your scientific message. This is important because you want editors and peer reviewers to know why your study matters. Try to think about the bigger picture. What large, over-arching research question does your work address? How will you achieve your goals in the work? Why is your work important to people in general? Have you addressed an important question? How are you going to 'sell' this to a journal editor?

We do this by establishing focus in our writing. Think about your variables, conditions, intervention: What are you investigating? Think about your measured outcome: What are you measuring? Think about your samples and nature of the source of the samples (e.g. nature of the people or group of people that the samples are taken from) Think about the sampling conditions and procedure : From where do your measurements come? Answering these questions before starting to write helps to establish focus, even come up with a good and effective title.

You may have heard of, or even used, the PICO checklist for healthcare researchers. This is based on the same principle.

- P.** Patient/population: Who does the work relate to?
- I.** Intervention: Which treatment?
- C.** Comparison: What is the control?
- O.** Outcome: What are you measuring?

Identify the central theme of your research and then use this to guide your readers at the start when designing your article. What is the research question? Why is your work important? What is unknown? What's the limitation of current work? Is there a controversy? Similarly, what are your aims? What do you plan to achieve? How is your work directly related to a research problem? How do you plan to test your results to demonstrate an effect? (e.g. What statistical methods/tests will you use?) Finally, what is the conclusion of your work? How do you answer the question? How does your work advance the field? These questions help to identify the key message of your research paper.

All research papers are based around hypotheses, or questions. Identifying yours clearly and simply will help with the initial writing process. Remember: There are really just three key things to know about before you sit down and start to write, message,

audience, and structure. Of these, messaging comes first in academic writing.

2.2. Developing a structure: The importance of outlines

We've talked about identifying and developing the message of your paper. The next key issue to consider is the importance of outlines. There are two factors to this: (1) How you can organise your ideas logically, and (2) How you can communicate these ideas in your paper. Factor (1) requires that you write an outline for your paper while factor (2) is the actual paper writing process itself. We will discuss these factors in more detail in this article.

In terms of developing an effective outline, the structure for your paper, keep in mind that author disputes are actually very common in academic writing. Different people have quite different ideas about the contents of papers. Therefore, discuss, before starting to write, with co-authors and colleagues and ensure all author agree with the outline contents before starting the writing process. Prevent disputes before starting to write.

It's also recommended that you write papers section-by-section before passing parts of each sections back to colleagues and co-authors to ask for feedback. This is both less stressful and more efficient. Colleagues and co-workers will also be more able to deal with requests for feedback if the length of text you are discussing is short. Turnaround times will be faster and, again, the process will be overall more efficient.

Don't forget to set achievable deadlines for your writing. It sounds basic, but we all procrastinate and put work off until tomorrow. A realistic schedule is important: Mark dates in your calendar and take into account time for meetings, experiments, conferences, and holidays. Make time to write: Mornings are often the best times to do creative work as you never know what will happen later (especially in the case for busy clinical researchers). Also, tell your colleagues about your writing projects. When you will be asking for feedback for each section? These suggestions will help you keep your paper writing on track.

2.3. Which section to write first? The 'write' order

The order in which sections appear in an academic article (Introduction, Methods, Results, Discussion) is actually not the order in which you should write. Usually, authors tend to start their papers with either the Methods or the Results first and then move on to write the Introduction and Discussion, Abstract, and Title.

First drafts are just that: First drafts. No-one expects anyone to come up with a finished paper at the first attempt. Write as you think and put the words down on the page. You can then edit, edit, and edit some more: Revise, revise, revise as the old saying goes. Read aloud as often ears can hear errors that your eyes will miss, especially regarding logical manuscript flow and syntax. Editing will also help you to remove unnecessary words as well as to get the terminology, spelling, and punctuation correct before final submission. Input from colleagues is also critical: Share your writing with colleagues who are not familiar with your work. This last point is especially important for the Methods sections of papers: Has enough information been included so that someone else can understand and potentially repeat the work?

3. Clinical manuscript structure

3.1. Title

Article Titles are absolutely key for enhancing research visibility. Simply put, a complex and hard to understand Title is a bad idea because people will struggle, they will not want to read more. It's so important to stand out: Be simple, clear and attractive. Clinical researchers are busy people. You need to get the main message of your paper into the Title to convince people to dive deeper into your work. Titles, Abstracts, and Keywords are also used by search engines to locate articles so you'll need to keep this in mind as well when writing.

Capture your reader's attention then with a concise, short, accurate and effective Title. English writing is better when kept short: Simple sentences with easy-to-understand words are always best for getting your message across. Important points here are to state what's key about the research, get Keywords into the title, perhaps introduce some information about study design (in the case of clinical work), and keep it short. Less than 20 words is ideal for a Title. Anymore and readers will lose interest and won't retain the information. Avoid using questions in your Title, being too vague, using abbreviations, or adding ambiguous terms like "new" or "novel". These tend to make readers suspicious.

A good formula for an effective clinical research title is to think about what you are investigating. What is the aim? What's the variable, condition, or intervention? What are you measuring? What's the outcome? Also, where are the measurements from? Participants, animals, tissues, cells? Some, or all, of this information can go into the Title.

One way to be effective with Title writing is to look at the kinds of headings used in recent papers in your field, published by international researchers. Which

kinds of papers are getting more citations? Analysis in this area corroborates remarks about short concise Titles. Readers want interesting, captivating studies that pose interesting questions. However, in clinical research it's also the case that journals often want authors to put together what are called "non-declarative" Titles where the actual result of the study is not revealed. This is important because we want clinical researchers to actually read and absorb the rest of the paper before potentially using a treatment or procedure on a patient.

"Cardioprotective and prognostic effects of ..." would be an example of a non-declarative Title, while "PGBD5 promotes site-specific oncogenetic mutations ..." is declarative. The outcome is presented in the title. These differences are also worth thinking about in the context of your next research paper. Journal guidelines can also help; investigate these before starting to write.

Developing an effective Title for a research paper is a very organic process. Come up with lots of alternatives and debate them with your co-authors. Don't just settle on the first Title you think of; as we've discussed, this will be very important for impact, discoverability and readability, especially when submitting to a multi- or cross-disciplinary journal. Engage editors, peer reviewers, and readers with an effective and eye-catching Title.

3.2. Abstract

One of the most important, if not *the* most important component of academic paper writing is the Abstract. Why? Remember readers. Most researchers are busy professionals and simply don't have the time to read everything published in their field, let alone in the wider subject area. Colleagues tend to read Abstracts to stay up-to-date in their field. This means that, unfortunately, your Abstract is often the only part of your paper that is read by peers, including editors and (sometimes) peer reviewers.

People form opinions fast about research articles which are then hard to change. They think "Do I want to download and read this paper?" Your goal is to convince colleagues that the answer to this question is "yes" Similarly, peer reviewers will think "Do I want to take the time to read this paper?" Again, their answer should be "yes", but this depends on how effectively and carefully an Abstract is written.

How can you easily and effectively write this 200 to 250 words of text? Abstracts can be broken down into four questions: Why did you do the study? What did you do? What did you find? What did you

conclude? (i.e. How will the study advance the field?)

These questions correspond to the four main sections of an academic article:

- Why did you do the study? (Introduction)
- What did you do? (Methods)
- What did you find? (Results)
- What did you conclude? (Discussion)

You can write down these four questions, then answer them with text from your own research, and then delete the questions. This technique will generate about 100 words or so of text that you can then edit, expand, and proof-read to develop the Abstract for your paper.

Keep in mind as well that actually two main kinds of Abstracts characterise academic articles: Structured and narrative. Answering the four questions above and then deleting the questions and running all text together will generate a narrative Abstract (written as a single block of text) while leaving in the structure leads to the former (divided into distinct sections). It's important to check the author guidelines for your target journal to see which kind of Abstract you are expected to write.

Abstracts are best written carefully, section-by-section. Start by identifying the background to the research (question 1) in no more than two or three sentences. You can use signposting words like "however", "indeed", and "nevertheless" to link sentences together and pose a clear, concise, and interesting research question. Then briefly present the Methods used in the study, again in a series of short concise sentences. "In this study, we used [methodology] to evaluate [aim]" or "Here, we evaluated [aim] using [methodology]". Structure the Abstract like this. Then briefly outline the Results and the main Conclusions ;The significance and outcomes. Why is the work interesting for readers?

A good way to approach Abstract writing is to always imagine you are writing for an academic conference. In this format, the Abstract is surely all people will read. Use this technique to develop effective, concise, and readable article Abstracts for research papers.

3.3. Keywords

One of the most common areas of confusion amongst authors is around the issue of journal Keywords. What are these? Why are they important? What are they for? You'll be asked to select a number (usually between four and eight) of Keywords which appear at the top of your paper

after the Abstract. You will then enter them into the journal online system when making a submission.

Sadly, many authors enter these words in a rush and don't really think about them in any detail. This is a shame because Keywords are very important for article discoverability. In short, if you want your article to be widely read and easily discoverable then Keywords are "key" for SEO, search engine optimisation.

What's SEO? Online databases use algorithms to find the most relevant articles based on input keywords. Other researchers searching for work in your field will use these databases all the time, we all do (i.e., Scopus, Web of Science, PubMed, etc). Thus, optimising the discoverability of your article increases your visibility.

Considering the words you include then as Keywords is important. One way to approach this is to look at the Keywords used in other, recent, similar international articles and also to make a list of the ones you'd use. Then search for these words in Web of Science (or similar): We are aiming for words that get a good number of hits but not too many (e.g., using "blood" as a Keyword will generate millions of hits, but will be no good for the discoverability of your article). Similarly, using a very specific term as a Keyword is also no good: Such words will receive handfuls of hits in database searches as few other researchers are likely to use them, or worse understand them.

A great resource here is the MeSH on demand database:

meshb.nlm.nih.gov/MeSHonDemand

This database is curated by the National Institutes of Health in the United States. Here you can enter, paste in the Abstract from your paper and the system will give you a number of useful Keyword suggestions. On this basis you can identify a larger number of keywords as a start (e.g., 12), test them in the MeSH database and then discard some to settle on a smaller number (e.g. 6) to use in the Title and Keywords of your next paper. Don't forget that search engines use the Title, Keywords, and Abstract to tag and identify research articles so you *don't want to duplicate words between your Title and Keywords*. This is an important point.

3.4 Introduction

The most important thing to think about when writing an Introduction is 'why does this study need to be done?' This is the aim of the work; the question your study aims to address. A well-structured Introduction therefore starts broad and general and

moves down to provide more specific information at the end of this section. Ensure your readers have the proper knowledge of a topic to understand it's importance. Editors might review the contents of your Introduction to ensure that your work fits with the scope of their journal. Keep in mind that the average length of an academic paper is around 5,000 to 6,000 words: Your article needs to be balanced. You don't want to write a 5,000 word Introduction and then much shorter subsequent sections. About 1,500 to 2,000 words for the Introduction is a good target length for this section.

Three paragraphs is a good template for an Introduction section, building the study down from general to more specific and finishing with the aims of the research presented in the article. Set the scene of the paper in the first paragraph: What is the question that your paper seeks to address? The topic introduction. Next, address the current treatment and problems. What has already been done on this issue, what is already known about the question or issue? This middle section of the Introduction sets the scene, outlines the 'state-of-the-art' relating to your research. Cite recent review papers and other up-to-date key pieces of research in this area.

Paragraph One: Why does your study need to be done? Introduce the topic and provide context for readers. What is the question that your research seeks to address? Why is it important?

Paragraph Two: What is currently known about this topic? Cite briefly recent studies and cite broadly work published around the world. Give your readers the state-of-the-art, bring them up-to-date with this particular research question. Convince them that they should read more to find out the answer to this question. Establish your expertise. Your research team is the one that should be working on this question. Perhaps you've published some recent work in this area in the past? Cite that, but in the context of other research as well. Similarly, what is not known about this question? Provide a clear description of the issue.

Paragraph Three: Outline the specific aims of your paper. High impact international journals tend to have Introduction sections that finish in the same way with phrases like "Here we show....", or "In this paper, we investigate ...". This is how you should structure this final section of your Introduction. Present the reader with a strong link between your problem and your aims.

Research question: "So far, however, it is not known how metformin affects the gut microbiota of individuals with treatment-naive T2D, nor how metformin interacts with gut bacteria."

Aims: “Here we performed a randomized, placebo-controlled, double-blind study in individuals with newly diagnosed T2D on a calorie-restricted diet, and we combined metagenomics and targeted metabolomics to investigate the effect of metformin on the composition and function of the gut microbiota.”

This kind of phraseology at the end of the Introduction also links to the Methods section so the reader expects what will come in the next section. As we have discussed, readers are all important in academic writing and they need to know where they are, where they have come from, and where they are going with the paper. A clearly written ‘aims statement’ at the end of your Introduction links into the Methods section. Now it’s time to tell your reader what you did and how you did it to address your research question.

3.5 Methods

The Methods section of a research paper is one of the most important parts; here, you have the chance to describe to your readers what you did in your study, over time. It is important that you do this clearly and concisely. What did you do first to address your question? What did you do second? What did you do third, and so on. Data analysis comes at the end of course, after data collection (you have to collect data before you can analyse it); for

this reason, Methods sections often end with ‘statistical analysis’ or ‘software’ used or similar.

Methods also need to be fully transparent. As we’ve noted, this is one area that peer reviewers will really focus on, so it’s important to be clear and ensure that a reader could replicate your work if necessary. Make sure all the key information is presented (don’t worry about length at first draft stage, you can always edit later and put material into an online supplement or appendix, if necessary). Think: What do your readers need to know? Who/what was used in the study? How did you conduct the research? How was the data analysed?

In terms of the first of these questions then, think about who and what was used in the study? Did you include human participants? How were samples taken? If so, what kind of selection, enrollment and inclusion/exclusion criteria were applied? If you include small numbers of participants then the expected variability will be small while a larger number of participants will lead to high expected variability (i.e., $p < 0.05$ versus $p < 0.01$) and correlated expected differences. These need to be clearly explained in the Methods. Similarly, if human participants are included then you need to be aware of the issues raised in the Declaration of Helsinki as well as you need to gain appropriate Institutional Review Board ethical approval and written informed consent (see Table 2).

Table 2. Resources to refer to for the inclusion of human subjects.

Checklist/resource	Link URL
Declaration of Helsinki	www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/
Institutional Review Board ethical approval	www.ncbi.nlm.nih.gov/pmc/articles/PMC3272525/publicationethics.org/case/institutional-review-board-approval-required www.spirit-statement.org/research-ethics-approval/
Written informed consent	www.ncbi.nlm.nih.gov/pmc/articles/PMC5341305/research-compliance.umich.edu/informed-consent-guidelines bmcomedethics.biomedcentral.com/articles/10.1186/s12910-018-0340-z

What about the use of animals in clinical research? Materials and samples need to be adequately described in this section, including strains of animals, their housing conditions, and adherence to any ethical guidelines. In terms of materials, which did you use? Where were they purchased? Which lot numbers? Give the reader enough information at all times to enable them to repeat the study.

Consider how you conducted the work. Which methodology and techniques did you use? Which conditions and optimisations? A good working system for the sections of an effective clinical Methods section in terms of study design would be:

(1) Primary end point; (2) Rationale; (3) Assessment; (4) Secondary end point; (5) Treatment. The sections of the Methods should be ordered according to the timeline of the study; what did you do first? what did you do second? and so on. This means that, as we have discussed, the Methods sections will end with analysis. How did you analyse your data? Discuss quantification methods and software as well as any statistical tests and data analysis. You’ll need to make your data available to other researchers, of course, so that they can have the chance to repeat your work. This can be done in the main text, or as supplements online.

3.6 Results

As we discussed, the Results section of a clinical paper are often the part we complete first: After experiments and treatments are concluded, you'll go ahead and make data tables, analyse for trends, and develop figures and graphs. You might not end up using all this content in your paper, but this is often the process researchers go through.

Your Results section should stick to the facts. The facts and nothing but the facts. Here, you present the outcomes of your experiments and treatments, logically guiding readers through the main findings of your research. Remember: You are very familiar with your findings, but your readers are not. Try to avoid cognitive bias where you assume that your readers are at the same level knowledge/background in a particular field as you. You are the expert. Probably no-one else in the world knows as much as you do about your research; you'll need to explain things to your readers, clearly, building a bridge to their (assumed more general) knowledge base.

This is done by guiding readers *one figure at a time* through the Results section. Use your figures to explain the outcomes of your research. So, one figure = one result. You can do this by providing a clear subheading for each figure and referring to figures in the text. Paragraphs can then be set up so you introduce an experiment, discuss the data you obtained, and then summarise key findings. Then repeat this formula for the next outcome or experiment. A figures can be panelled or part of a larger presentations. This basic structural approach works well as a way of clearly presenting and explaining results in this section.

It's also important to avoid some of the most common mistakes researchers tend to make when writing Results sections. The most common of these is the duplication of data between figures and text. Once you have presented data in a figure, you don't need to repeat that outcome in the main text. Highlight important trends in the figures and tables; here you *factually present* data and analyses to your readers, while in the main text of the paper you *describe* trends and patterns that you want readers to appreciate. No interpretation though, this comes later, in the next section (Discussion).

Figure 5 outlines an easy-to-use paragraph structure for the Results section of a clinical paper that maintains logical flow from one part to another. Start by introducing a claim (or question) via a figure, or figure subpart and then support that claim with data (also in the figure), then summarise the importance of that component of the research. You can also use keywords to guide readers through your findings in this section. You need to state what was

done, then state key trends, relevance, and importance for each key result (each figure). Introduce a figure, add supporting data, and then summarise the importance of the outcome. This approach works well, and it also keeps the word count down to a minimum (something that journals will also appreciate).

3.7 Discussion (and Conclusions)

The shape of a well-written Discussion section is the direct opposite to that of an Introduction. Here, you start specific and move into more general information as you approach the end of the paper. Remember your readers. Colleagues will be expecting to learn the outcomes of your research, your question, at the start of the Discussion. This is what they have waited for; what is the answer to your research question? Now it's important to tell your reader how your study contributes to the field. Summarise what you did by reintroducing the topic, restating the research problem, and talking about your key achievements.

Effective Discussion sections start, therefore, by restating the overall research question of the paper and then telling the readers the answer. Re-introduce your topic, re-state your motivation, and then summarise your achievements, in that order. This is a good working structure. This is the specific information needed to start this section. Then you should expand and become more and more general, discussing how your findings can be interpreted and what they mean for the wider research area. Their significance and implications. What can your research not show? What questions for future research does your study raise? What's the relationship between your work and other studies?

Many researchers shy away from reporting negative results, let alone discussing them in their articles but this can actually be very important. Negative results are important. What adverse events or negative results did your study generate? Reporting negative results can actually be very positive as this prevents research waste (stops other researchers carrying out the same experiments) and allows for the generation of new hypotheses. Negative or inconclusive results are also important for systematic reviews and, indeed, actually demonstrate the robustness of the study. You should *discuss negative results with expertise*: You are the experts. What was the result? What's the explanation? How does this help with future hypothesis generation? What about impact on study validity? These kinds of outcomes also lead to discussions of potential study limitations. It's important to discuss the effect of potential limitations on your current study as well recommendations (next steps) to overcome these issues in future work.

One really important theme to work into your Discussion is suggestions for future research, based on the outcomes of your current analysis. Why? Because you don't want others to read your work, come up with new ideas based on your analysis, and then not have to cite you. You deserve credit for your ideas: If you think of a new direction, hypothesis, or experiment based on your current project, write it down in the Discussion. Then other researchers will be forced to cite you in their next article. Why is your work important to the field? What are the main conclusions and implications of the work.

You also want to finish strongly: Put the main outcomes of your work, the most significant conclusions at the end. These are the parts that people will read last, so make them strong. Far too many researchers end their papers with phrases like "more research will be needed to fully understand the outcomes of this analysis", or "further work will be required before we can complete this analysis". It might be true (indeed, further research is always needed), but this should not be the last piece of text you present to your readers. Writing the end of a paper is like running a race: Finish strongly. Be positive. Emphasise your main outcomes.

This last part of your paper is the Conclusions (even if your target journal does not ask for a distinct Conclusions section, it will be at the end of the Discussion). This part is very important: What will be remembered most by your readers about your study. This is the "take-home message".

Here you should provide the answer to the problem that your paper seeks to address, outline the one or two main findings of the work, discuss your immediate contribution to the field, and explain how your work shapes this research area in the future. This last point shows that you are a "thought leader" in your area and is especially important. As a researcher, you are shaping your field. Be specific: How does your study improve understanding? You have the chance to establish your expertise to build credibility.

4. Summary

The aim of this article has been to provide an outline, a series of templates, to enable you to write a clinical research manuscript more effectively. The key to doing this successfully is to *link your ideas together logically* throughout your paper and think about the answers to four key questions:

- Why does this study need to be done?
- What did you do?
- What did you find?
- How does your study advance the field? (What did you conclude?)

Seem familiar? Yes, these are the same four questions we discussed when we talked about writing an effective Abstract. It's the same outcome. The Abstract is a distillation of the main paper and each has the same goal; to attract, hook, and retain readers so that they want to use and refer to your paper. Cite your paper. Research articles that are not cited and used might as well not have been written.

Start broad in the Introduction and work downwards, becoming more-and-more specific before broadening the scope of your article again in the Discussion.

Above all, remember that before starting to write your next academic article it's important to think about three issues and have answers in mind: (1) What is your message? (the takeaway, the one key thing you want people to remember from reading your work); (2) Who are your audience? (which journal will you target with the paper), and; (3) What will be the structure of the article? These three "things to know" are a package; we've emphasised discussion of structure in this article.

It is hoped that you will find these guidelines useful when you plan and write your next paper.



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