

Handbook of Biomedical Research Writing: The Journal Article Abstract

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5.0 The Journal Article Abstract

The abstract is the most important part of a journal article. It is the most widely read, and it includes all the main points. However, it may also be the most difficult to write. So much must be included within a limited number of words. This chapter will review the structure of abstracts, address issues specific to medical abstract writing, and present a number of language tips for writing abstracts in English.

5.1 Comparison of Abstracts and Journal Articles

The following chart shows similarities and differences between a journal article abstract and the main body of a journal article.

Abstract	Article
Audience: People searching in the library.	People doing similar research read and sometimes cite the paper.
Audience: People reading abstract collections.	Graduate students may be required to read the paper in survey courses.
Audience: All article readers.	Only a few practitioners read the whole paper.
Audience: Almost all readers only read the abstract (anecdotal estimate 95%).	Relatively few people read some or all of the article (anecdotal estimate 5%).
Purpose 1: Summarize the article.	Purpose: Participate in the academic community.
Purpose 2: "Sell" your paper.	
Read first	Almost always read after the abstract
Written last	Almost always written before the final draft of the abstract
Short word limit	Longer word limit
May be translated into several languages	Is normally written in one language
Reader may have knowledge of the background of and justification for your study	Reader should learn the background of and justification for your study from the text
Reader should be able to understand your main findings	Reader should learn the details, limits, and implications of your results
Knowledgeable reader can understand the basics, but not critique or replicate your study (exception: clinical medicine)	Reader should be able to understand, critique, and replicate your study
Agree on all details	
Use the same writing style, formality	
Both must meet the requirements of the journal guidelines	
Each can be read independently of the other text	
Follow the same structure	

5.2 The Structure and Content of Abstracts

5.2.1 Structured Abstracts

All good abstracts have a structure. However, “structured abstracts” are those with a particular structure required by the journal editor. A structured abstract is divided into sections with headings in bold print, like the following example from the medical journal *BMJ*. Note that other journals may use different headings.

Example:

Advice to use topical or oral ibuprofen for chronic knee pain in older people: randomised controlled trial and patient preference study

Objective To determine whether older patients with chronic knee pain should be advised to use topical or oral non-steroidal anti-inflammatory drugs (NSAIDs).

Design Randomised controlled trial and patient preference study.

Setting 26 general practices.

Participants People aged ≥ 50 with knee pain: 282 in randomised trial and 303 in preference study.

Interventions Advice to use topical or oral ibuprofen.

Primary outcome measures WOMAC (Western Ontario and McMaster Universities) osteoarthritis index, major and minor adverse effects.

Results Changes in global WOMAC scores at 12 months were equivalent. In the randomised trial the difference (topical minus oral) was two points (95% confidence interval -2 to 6); in the preference study, it was one point (-4 to 6). There were no differences in major adverse effects in the trial or study. The only significant differences in secondary outcomes were in the randomised trial. The oral group had more respiratory adverse effects (17% v 7%, 95% confidence interval for difference -17% to -2%), the change in serum creatinine was 3.7 mmol/l less favourable (0.9 $\mu\text{mol/l}$ to 6.5 $\mu\text{mol/l}$); and more participants changed treatments because of adverse effects (16% v 1%, -16% to -5%). In the topical group more participants had chronic pain grade III or IV at three months, and more participants changed treatment because of ineffectiveness.

Conclusions Advice to use oral or topical preparations has an equivalent effect on knee pain over one year, and there are more minor side effects with oral NSAIDs. Topical NSAIDs may be a useful alternative to oral NSAIDs.

Underwood M, Ashby D, Cross P, Hennessy E, Letley L, Martin J, et al. Advice to use topical or oral ibuprofen for chronic knee pain in older people: randomised controlled trial and patient preference study. *BMJ*. 2008 Jan 19;336(7636):138-142.

The structured abstract was originally developed for a unique audience—in this case, practitioners. It is designed for clinicians who don't have time to read the whole article and may often not be doing research at all. However, if you are a lab scientist, don't skip to the next section yet. The trend toward requiring structured abstracts is gradually spreading throughout the experimental sciences. Even if your field's key journals don't use structured abstracts yet, they may soon. It's a good idea to be familiar with how structured abstracts work.

Because the “conclusions” section of a structured abstract is separate, readers may even read only that portion of the abstract. On the other hand, the structured abstract contains more detail about methods and results than a normal abstract, so that it's possible to make a tentative critique of the quality and value of the study.

A clinical journal's author's guidelines usually list the required structured abstract headings. Sometimes there are variations for different types of articles. For example, *BMJ's* guidelines allow for fewer headings for qualitative studies, and a completely different set of headings for quality improvement articles. In addition, the *BMJ* guidelines say, “If the standard headings do not suit the type of study, substitute something sensible such as ‘population’ as a heading instead of ‘participants’ in an economics article. Please do not simply delete the heading.”

Whichever set of headings you use, it is possible to write brief notes instead of complete sentences for some of the headings. For example, another article in the same journal issue included an abstract with only the word “Tanzania” after the heading *Setting*.

Lubell Y, Reyburn H, Mbakilwa H, Mwangi R, Chonya S, Whitty CJ, et al. The impact of response to the results of diagnostic tests for malaria: cost-benefit analysis. *BMJ*. 2008 Jan 26;336(7637):202-5.

It is also unnecessary to use the headings in the abstract as the subheadings in the body of the paper. For example, in the abstract above, the headings are as follows: *Objectives, Design, Setting, Participants, Interventions, Primary Outcome Measures, Results, Conclusions*. However, the body of the paper is divided into the following sections and subsections:

Introduction

Method

- Recruitment
- Quality control
- Assignment
- Participant flow and follow-up
- Intervention
- Masking
- Outcome measures
- Adverse effects
- Prescribing data
- Sample size
- Analysis

Results

- Participant recruitment
- Baseline characteristics
- Follow-up
- Primary outcome
- Adverse effects
- Secondary outcomes
- Adherence with treatment route

Discussion

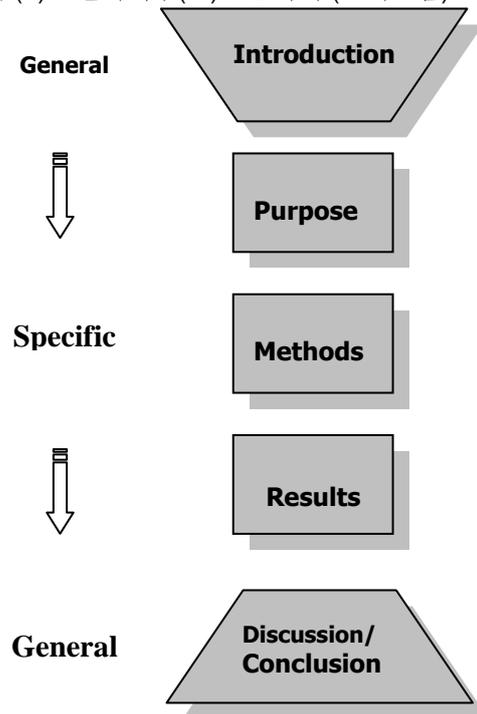
- Main findings
- Preferences
- Applicability to routine practice
- Statistical power
- Potential for bias
- Use of prescribed medication
- Meaning of the study

Structured abstracts tend to be longer than traditional abstracts. However, the journal typically has some kind of word limit. Keep in mind that the journal database MEDLINE will cut off anything longer than 4096 characters. You can count the number of characters automatically in MS Word by going to Tools > Word Count and viewing Characters (with spaces). In Korean: 도구(T) > 단어개수(W) > 문자 수(공백포함).

5.2.2 Unstructured Abstracts

Outside of journals for practitioners, such as physicians and nurses, most biomedical journals do not yet require structured abstracts. Instead, you as the author have the freedom to allocate the limited space as you choose. Nevertheless, there are some common practices for organizing the abstract of a research report.

First of all, abstracts present material in the same order as the body of the paper. However, some sections of the paper contribute more detailed information to the abstract, while other sections can almost be skipped. The typical experimental or engineering paper in biomedicine will use the most abstract space for results. However, in areas of biomedicine more related to social science, such as epidemiology and many subfields of nursing, the introduction may deserve more abstract space. If your paper presents a new research or clinical procedure, the method section of the abstract will be larger. The discussion/conclusion section is often dealt with only briefly because it cannot be summarized in a short space.



5.2.3 Structure of the Abstract Detailed

The following list (Turner, 2006) includes the various sections that may exist in a research report abstract. Keep in mind that most abstracts do not include all these sections, and they do not appear in a particular order. I recommend that you take three well-written articles from your own subfield and identify which of the following sections appear in their abstracts. Those are probably the sections that you will need when you write your own abstract.

1. Introduction	
A. Background of the research	
B. Research problem or research questions	
C. Gap or lack of research in the field	More common in social sciences and almost required in dissertation writing to show that your thesis is a significant document.
D. Purpose of the paper	Many sciences and engineering abstracts do not have much background but start with the purpose of the research or even the method.
E. Description of the paper	Summarizes what the paper does.
2. Methods	Methods sections are generally longer in Dissertations. Smaller in other abstracts.
3. Results	Many scientific abstracts concentrate more on the results rather than the Introduction or Conclusion.
4. Conclusion	Main contribution of the paper. May be hard to distinguish from results.
A. Blueprint: introduction of topics or issues that will be discussed	More likely in papers that are not based on an experimental design and in the social sciences.
B. Recommendations	More common in social sciences, medicine and nursing. Recommendations to change policies, etc.
C. Implications	Importance of the results for the field as a whole.

Turner A. English Solutions for Engineering Writing. Hanyang University Center for Teaching and Learning; 2007.

5.2.4 Example Unstructured Abstract

Below is an example of an unstructured abstract. It summarizes an article about people with asthma who cannot tolerate taking aspirin. The research focuses on identifying the genes connected to this intolerance. These researchers looked for a different genetic cause that others have not considered (the gap in the research). Note that they devote more than half of the abstract to methods and results. I have underlined some key words that clarify the organization of the text. Try reading only the underlined parts to see how clear the structure is, even though this is an “unstructured” abstract.

1. Introduction	
Background of the research	Genetic predisposition is linked to the pathogenesis of aspirin-intolerant asthma (AIA).
Gap or lack of research in the field	<u>Most</u> candidate gene <u>approaches have focused on</u> leukotriene-related pathways, <u>while there have been relatively few studies evaluating</u> the effects of polymorphisms in prostanoid receptor genes on the development of AIA.
Research question	<u>Therefore, we investigated</u> the potential association between prostanoid receptor gene polymorphisms and the AIA phenotype.
2. Methods (note the transition to the results in mid-sentence)	<u>We screened for</u> genetic variations in the prostanoid receptor genes <i>PTGER1</i> , <i>PTGER2</i> , <i>PTGER3</i> , <i>PTGER4</i> , <i>PTGDR</i> , <i>PTGIR</i> , <i>PTGFR</i> , and <i>TBXA2R</i> using direct sequencing, <u>and selected</u> 32 tagging single nucleotide polymorphisms (SNPs) among the 77 polymorphisms with frequencies >0.02 based on linkage disequilibrium for genotyping. <u>We compared</u> the genotype distributions and allele frequencies of three subject groups [108 patients with AIA, 93 patients with aspirin-tolerant

	asthma (ATA), and 140 normal controls]. <u>Through association analysis studies</u> of the 32 SNPs, . . .
3. Results	. . . <u>the following SNPs were found</u> to have significant associations with the AIA phenotype: -616C>G ($P = 0.038$) and -166G>A ($P = 0.023$) in <i>PTGER2</i> ; -1709T>A ($P = 0.043$) in <i>PTGER3</i> ; -1254A>G ($P = 0.018$) in <i>PTGER4</i> ; 1915T>C ($P = 0.015$) in <i>PTGIR</i> ; and -4684C>T ($P = 0.027$) and 795T>C ($P = 0.032$) in <i>TBXA2R</i> . In the haplotype analysis of each gene, <u>the frequency of PTGIR ht3[G-G-C-C]</u> , which includes 1915T>C, <u>differed significantly between</u> the AIA patients and ATA patients ($P = 0.015$).
4. Conclusion	
Implications	<u>These findings suggest that</u> genetic polymorphisms in <i>PTGER2</i> , <i>PTGER3</i> , <i>PTGER4</i> , <i>PTGIR</i> , and <i>TBXA2R</i> play important roles in the pathogenesis of AIA.

5.2.5 Other Types of Abstracts

There are a number of types of abstracts other than the standard journal article abstract. Here are three common ones.

Abstracts for General Audiences

A simplified summary for more general audiences is often found introducing articles in journals like *Nature*, *Science*, and *Proceedings of the National Academy of Sciences*. The article may be quite technical, but the abstract is much simpler. Readers of the abstract are more likely to be from other academic disciplines, or even be laypeople (with no advanced formal education in science).

Example:

Modeling the Heart—from Genes to Cells to the Whole Organ

Successful physiological analysis requires an understanding of the functional interactions between the key components of cells, organs, and systems, as well as how these interactions change in disease states. This information resides neither in the genome nor even in the individual proteins that genes code for. It lies at the level of protein interactions within the context of subcellular, cellular, tissue, organ, and system structures. There is therefore no alternative to copying nature and computing these interactions to determine the logic of healthy and diseased states. The rapid growth in biological databases; models of cells, tissues, and organs; and the development of powerful computing hardware and algorithms have made it possible to explore functionality in a quantitative manner all the way from the level of genes to the physiological function of whole organs and regulatory systems. This review illustrates this development in the case of the heart. Systems physiology of the 21st century is set to become highly quantitative and, therefore, one of the most computer-intensive disciplines.

Noble D. Modeling the Heart—from Genes to Cells to the Whole Organ. *Science*. 2002 Mar 1;295(5560):1678-82. Review.

Abstracts for Review Articles

Reviews and minireviews in most journals are aimed at a less general audience than *Science* and *Nature*, but more general than that of complete journal articles. They summarize and discuss the work of several studies. The whole article, not just the abstract, is meant for the general audience. Here is an example of the abstract of a review from a journal about the brain.

Example:

Is There A Link Between Adult Neurogenesis and Learning?

During the past several years, evidence has accumulated suggesting a relationship between newly born cells in the hippocampus and various types of learning and memory. However, most of the evidence is correlational and some of it does not agree. This review discusses both sides of this issue, considering the effects of learning on the production of new neurons in the dentate gyrus and the question of whether newly born cells participate in learning and memory.

Abstracts for Case Reports

Clinical case studies sometimes have an abstract. Because they are often quite short, some journals do not allow an abstract. Other journals require one. Here is an example of a case report abstract. Note how brief it is. For more information about case studies, see the chapter on clinical case reports.

Example:

Bell's palsy associated with influenza vaccination: Two case reports

The etiology of Bell's palsy is often unknown. We present herein two cases of adults who developed a Bell's palsy following the administration of an influenza vaccine. While the incidence is low, with the widespread recommendation for annual influenza vaccines, patients should be apprised of the possibility of this complication and the benefit of early treatment.

Chou CH, Liou WP, Hu KI, Loh CH, Chou CC, Chen YH. Bell's palsy associated with influenza vaccination: Two case reports. *Vaccine*. 2007 Apr 12;25(15):2839-41.

5.3 Issues Unique to Abstracts in Biomedical Journals

Natural science, medicine and engineering represent the great majority of published academic research. However, it is biomedicine in particular that faces the most critical issues regarding quality of research publication for the following reasons:

1. Many studies address questions of human life or death.
2. Business (especially pharmaceutical) interest in publishing biased results exerts great pressure on editorial boards.
3. Within the sciences, particularly some areas of biomedical science, the pressure to publish is even more intense than in other fields.
4. The total time from submission to publication is relatively short.
5. Scholars around the world from various cultural and ethical traditions are participating in the publication process.

All of these factors apply pressure to the quality and accuracy of medical journal articles, and particularly the titles and abstracts, which are most widely read.

These results follow:

1. A great deal of research on medical journal article and abstract writing is being published.
2. Researchers are finding a large number of errors and ambiguities in biomedical articles, particularly clinical studies.
3. The field is ahead of others in developing strict standards for journal article and abstract writing.

The following three lists provide specific advice based on this recent research. The first is a list of criteria for abstracts of clinical papers suggested by the *Journal of the American Medical Association (JAMA)*. The second is even more specific. Its authors used the 30 questions to evaluate dermatology abstracts, but most of the questions should apply across medicine and nursing. The third is a checklist specifically for randomized controlled trials.

Quality Criteria [for Abstracts of Articles Published in JAMA]

1. Abstract headings are consistent with structured abstract format.
2. Data in abstract are consistent with text, tables, and figures.
3. Data or information in the abstract are presented in the text, tables, or figures.
4. Years of study and length of follow-up are provided.
5. Results for Main Outcome Measures are presented in Results section (avoid selective reporting).
6. Results are quantified with numerators, denominators, odds ratios, and confidence intervals where appropriate.

7. Absolute differences rather than relative differences are presented wherever possible (e.g., "Mortality declined from 6% to 3%" rather than "Mortality declined 50%").
8. For randomized trials, analysis is identified as intent-to-treat or evaluable patient analysis.
9. For surveys, response rate is provided in the Results or Design.
10. For multivariate analysis, factors controlled for in model are briefly summarized.
11. Conclusions follow from information contained within the abstract.

List quoted from: Winker MA. The need for concrete improvement in abstract quality. JAMA. 1999 Mar 24-31;281(12):1129-30.

Abstract Quality Scale

Category	Criterion
Objective	Was any information on the objective given?
	Was the objective explicitly stated?
	Was the main objective distinguished from secondary ones?
Design	Was any information on the research design given?
	Were technical descriptors* used?
	If a follow-up study, was the duration given?
Setting	Was any information on the setting given?
	Was the level of clinical care (e.g., primary care) indicated?
Subjects	Was any information on the subjects given?
	Were common demographic characteristics given?
	Were technical descriptors* of subject selection (e.g., random sample) used?
	Was the number of subjects indicated?
	Were the response and refusal rates indicated?
	Was the number of dropouts and losses indicated?
	If the samples were matched, were matching characteristics given?
Intervention†	Was any information on the intervention given?
	Was a description given?
	Was the duration indicated?
Measurement of Variables	Was any information on the measures given?
	Were the variables explicitly given?
	Was the source of data given?
	If the measurements were subjective, was blinding (or nonblinding) of the observer mentioned?
Results	Were any results given?
	Were they directly related to the objective?
	Were the appropriate numeric data given?
Conclusions	Were any conclusions drawn?
	Were they directly related to the objective?
	Were they consistent with the results?
	Were the study's limitations mentioned?
	Were the study's implications mentioned?

* Technical descriptors refer to those listed by the Ad Hoc Working Group for Critical Appraisal of the Medical Literature.

† Intervention category was quoted only for therapeutic trials.

Dupuy A, Khosrotehrani K, Lebbé C, Rybojad M, Morel P. Quality of abstracts in 3 clinical dermatology journals. Arch Dermatol. 2003 May;139(5):589-93.

Items to Include when Reporting a Randomized Trial in a Journal or Conference Abstract

Item	Description
Title	Identification of the study as randomized
Authors	Contact details for the corresponding author
Trial design	Description of the trial design (e.g. parallel, cluster, non-inferiority)
Methods	
Participants	Eligibility criteria for participants and the settings where the data were collected
Interventions	Interventions intended for each group
Objective	Specific objective or hypothesis
Outcome	Clearly defined primary outcome for this report
Randomization	How participants were allocated to interventions
Blinding (masking)	Whether or not participants, care givers, and those assessing the outcomes were blinded to group assignment
Results	
Numbers randomized	Number of participants randomized to each group
Recruitment	Trial status
Numbers analysed	Number of participants analysed in each group
Outcome	For the primary outcome, a result for each group and the estimated effect size and its precision
Harms	Important adverse events or side effects
Conclusions	General interpretation of the results
Trial registration	Registration number and name of trial register
Funding	Source of funding

Hopewell S, Clarke M, Moher D, Wager E, Middleton P, Altman DG, et al.; CONSORT Group. CONSORT for reporting randomized controlled trials in journal and conference abstracts: explanation and elaboration. *PLoS Med.* 2008 Jan 22;5(1):e20.

5.4 The Language of Abstract Writing

Here are some of the characteristics of abstract language.

1. Often Uses the Third Person

In other words: he/she/it/they, not I/we/you

Examples:

It was found that . . .

Choi reported . . .

Oxygen was administered . . .

Patients with low immunity recovered . . .

2. Often Uses Passive Voice Verbs to Describe the Researchers' Own Actions

As discussed in more detail in the methods chapter of this book, traditionally, the passive voice has been used in science writing to describe the researcher's actions. The use of "we" + active verb is becoming more common in some subfields of biomedicine.

Passive: "It was found that . . ."

vs.

Active: "We found that . . ."

Note: Active voice, however, is used to describe phenomena in the study:

Examples:

The mice grew . . .

Patients responded . . .

Water evaporated . . .

3. Negative results and conclusions not included

Although longer conference abstracts may include null results, they are not typically included in a journal article abstract if other more positive results have been found as well. The exception is in clinical fields, where healthcare practitioners may make decisions about how to treat patients based on reading abstracts. In those cases, null results should be included. (See #5 in JAMA Abstract Quality Criteria.)

Examples:

X Z was not found.

X It was not possible to test for Y.

4. Avoids abbreviation, jargon, other language shortcuts that may lead to confusion

If you use an abbreviation, write out the meaning. If you are absolutely certain all your readers will understand, you can use the abbreviation. Consider those from other countries and new graduate student readers.

5. Avoids repetition

Sometimes repetition helps the reader follow your argument. Because there isn't enough room for repetition in the abstract, it's more difficult to read.

6. Avoids meaningless expressions

Examples:

X Results are provided.

X Discussion follows.

7. Avoids adjectives and descriptive details

8. Avoids illustration

This includes both literal pictures as well as examples.

9. Avoids footnotes

10. Avoids preliminaries

Example:

X This paper discusses three issues.

11. Avoids superlatives

Instead of using words like "very" and "extremely," try to choose stronger nouns and verbs.

Examples:

X very, extremely

12. Drugs listed with generic names

Use the international generic name for drugs. When the brand name is very well-known, it can be mentioned once in parentheses ().

Examples:

Fluoxetine hydrochloride (Prozac) toxicity in a neonate

Spencer MJ. Fluoxetine hydrochloride (Prozac) toxicity in a neonate. *Pediatrics*. 1993 Nov;92(5):721-2.

13. New terms are defined

Examples:

1-11 adapted from: Graetz N. Teaching ESL students to extract structural information from abstracts. In Ulijn, J.M. and A.K. Pugh (eds.) *Reading for professional purposes*. Leuven, Belgium: ACCO; 1985.

12-13 adapted from: Taylor D, Rose JB. Writing an abstract in the health sciences and social work. University of Toronto Health Sciences Writing Centre website. <http://www.utoronto.ca/hswriting/abstract.htm> . Retrieved May 2007.

5.5 Avoiding Ambiguity in Concise Writing

Concise: expressing much with few words, clear (American Heritage Dictionary)

Ambiguity: more than one way of understanding is possible

Word limits encourage concise writing. Concise writing is good. The problem is, when we try to be brief, we don't always express ideas clearly. There may be more than one way to interpret the same sentence. In more literary disciplines, ambiguity can be a positive trait of writing. It creates a sense of poetry in the text. However, in science writing, it is critical to avoid ambiguity as much as possible.

Here are some examples of ambiguity and suggested corrections. Note that there are no grammar errors in any of the original texts quoted below. Nevertheless, there is more than one way to interpret them.

Source of Ambiguity: Relative clause not placed next to the word it modifies

Original: Interleukin (IL)-21 is a member of type I cytokine family, which is produced by activated CD4⁺ T cells and regulates growth, differentiation and maturation of lymphoid lineage cells.

Problem: It seems that the family, not (IL)-21, is produced.

Possible solution: Interleukin (IL)-21, which is produced by activated CD4⁺ T cells and regulates growth, differentiation and maturation of lymphoid lineage cells, is a member of type I cytokine family. 

Problem: The emphasis is on the type I cytokine family, but this doesn't seem most important.

Deleted: "is"

Suggested solution: Interleukin (IL)-21, a member of type I cytokine family, is produced by activated CD4⁺ T cells and regulates growth, differentiation and maturation of lymphoid lineage cells.

Deleted: "which"

Source of ambiguity: Unclear use of connecting words (and, but, or, etc.)

Original: Most importantly, joint-draining lymph nodes from IL-21R-Ig-injected mice contained significantly fewer CD4⁺CD25⁻ cells expressing PD-1 and B7.1, B220⁺IgG₁⁺ cells, and B220⁻Syndecan-1⁺ cells than those from control IgG₁-administered mice.

Problem: It is unclear how the text after the highlighted "and" connects to the first part of the text.

Possible solution: Most importantly, joint-draining lymph nodes from IL-21R-Ig-injected mice contained significantly **fewer 1)** CD4⁺CD25⁻ cells expressing PD-1 and B7.1, **2)** B220⁺IgG₁⁺ cells, and **3)** B220⁻Syndecan-1⁺ cells **than** those from control IgG₁-administered mice.

Problem: **The structure is clear, but numbering should be avoided when unnecessary. Also, the distance between “fewer” and “than” means the comparison is still hard to read. The last part looks like “B220-Syndecan-1⁺ cells than those from control . . .”**

Suggested solution: Most importantly, joint-draining lymph nodes from IL-21R-Ig-injected mice contained significantly **fewer** CD4⁺CD25⁻ cells expressing **both** PD-1 and B7.1, **fewer** B220⁺IgG₁⁺ cells, and **fewer** B220⁻Syndecan-1⁺ cells than those from control IgG₁-administered mice.

5.6 Dealing with the Word Limit

One of the most difficult aspects of writing an abstract is the strict word limit. Here are some strategies for shortening an abstract, or even the body of an article, that is not meeting the word limit.

Step One: Tighten up your language

- A. Eliminate meaningless phrases
- B. Eliminate phrasal verbs & superlatives
- C. Consider cutting prepositions, especially “of”
- D. Consider changing noun phrases to verbs

What’s wrong with this abstract?

X Example:

This paper discusses research which was undertaken in the author's country. A theoretical framework is developed from a literature search and this is used by the authors as the basis of an analytical model. The researchers collected data within this framework and analysed it according to the precepts laid down by earlier researchers in the field. The data is used to demonstrate that our understanding can be significantly increased and this is discussed in the light of previous work. Conclusions are drawn and it is shown that these may be useful for practitioners.

Hughes W. Refereed journal papers: Practice and process. 2005. <http://www.personal.rdg.ac.uk/~kcsu/wil/publish/Glasgow2005.pdf>. Retrieved November 2006.

Obviously, the sample abstract above contains no details. Although this is an extreme case (actually it's a joke, not a real abstract), many writers do make the error of using some of these expressions, such as “The data is discussed in the light of previous work.” If it is not possible to summarize a number of complex points briefly, do not write a vague sentence. Instead, choose the most important point, and explain it clearly. If you are dealing with the discussion/conclusion, you may wish to drop the sentence altogether.

Shortcuts to avoid

The list below includes several steps that will make your abstract shorter, but they are not acceptable. Do NOT . . .

- Cut articles (a/an/the): This is sometimes done in abstracting journals, but you shouldn't do it for your own articles.
- Cut “and” and other logical connectors critical to your meaning
- Create contractions (don't, can't, they'll, etc.)
- Create abbreviations that are not widely known (remember your international and graduate student readers)

Step Two: Step back from your writing, then cut details, but not whole sections

How to step back

- Set the paper aside when possible, even for five minutes.
- Make a voice recording summarizing your research. Then listen and write down the main points.
- Summarize your research for a colleague. Then compare your summary to the abstract.
- Rank each bit of information from most to least important. Cut the least important bit.
- Imagine you lost your draft. Try writing the abstract again from the beginning.
- Write some notes about your audience. Write about who the readers are, what's important to them, and what questions they might ask when they read your paper. Then consider what would be best to include in the abstract for your readers.

Final Step: Cut one or more sections of IMRD.

Leaving sections out of the abstract is quite common in some fields of study. In fact, Hyland (2004) found that over 95% of abstracts across scientific and non-scientific disciplines left out at least one part. According to Swales (2004), even the results of some “very complex or . . . theoretical” papers cannot be adequately represented in a short summary.

Hyland K. *Disciplinary Discourses: Social Interactions in Academic Writing*. Ann Arbor: U of Michigan; 2004. page 82.
Swales JM, Feak CB. *Academic Writing for Graduate Students*, 2nd ed. Ann Arbor: U of Michigan; 2004.

On the other hand, it's not possible to leave out sections when a structured abstract is required, and the trend in science seems to be moving toward more carefully crafted abstracts for the audience that doesn't read the whole paper. One study, focusing on biology only, is summarized below.

Change in Percentage of Biology Abstracts

Containing Each Part of the I(P)MRD Structure 1980→1997

Introduction	Purpose	Method	Results	Conclusion
13 → 32	57 →71	59 →63	97→100	20→40

1980, n=30; 1997, n=100.

Adapted from Hyland K. *Disciplinary Discourses: Social Interactions in Academic Writing*. Ann Arbor: U of Michigan; 2004. page 82.

In summary, mentioning all sections of the article is becoming more common with increased competition in the field and is now always required in clinical medicine, but in some fields, it may not be possible or necessary.

5.7 Common mistakes

Turner (2006) lists a few common errors in preparing abstracts for publication or conference proposals. They are excerpted below.

1. Holding back significant points or information to try to get the reader to read the article.

An abstract is not a mystery story but should contain all the significant points of the article.

2. Including references such as (Kim et al., 2000) or [1] or ¹ in the abstract.

Only a very few conference abstracts ask for references.

3. Including paragraphs

Since abstracts are put in databases they don't usually have paragraphs. Even most 350 word Dissertation or Thesis abstracts don't have paragraphs. Individual university departments may be flexible, however.

4. Wasting introduction sentences

The lead sentence of an abstract should not be too general; it should include the topic of your paper. Here is an example of a wasted first sentence of an abstract. There is not enough information to give the reader a clear idea of what the paper is about.

"The Internet is very important these days."

5. Using the same sentence for the first line of the abstract and the first line of the introduction.

It is considered poor writing style.

Turner A. *English Solutions for Engineering Research Writing*. 2006.

5.8 Recommended Reading

Cummings P, Rivara FP, Koepsell TD. Writing informative abstracts for journal articles. *Arch Pediatr Adolesc Med*. 2004 Nov;158(11):1086-8.<http://archpedi.ama-assn.org/cgi/content/full/158/11/1086> [Many good examples for a clinical article.]

Journal of Neuroscience website. http://www.jneurosci.org/misc/ifa_minireviews.shtml

Swales JM, Feak CB. *English in Today's Research World*. Ann Arbor: U of Michigan Press; 2000.

Taylor, D. and Rose, JB. Writing an abstract in the health sciences and social work. University of Toronto Health Sciences Writing Centre website. <http://www.utoronto.ca/hswriting/abstract.htm>