



Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology

SPECIAL CONTRIBUTION

A guide for preparing a patient-oriented research manuscript

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Ours is a mentor-driven specialty, and like those before me I have learned by observing others. Continuing the tradition, I would like to share some strategies and detail some tactics I use for preparing a manuscript. The best patient-oriented research papers I have read are those that do not make me work too hard to understand their meanings. It follows, therefore, that writing a patient-oriented research paper should be a straightforward exercise that translates data into a clear, practical lesson for the clinician. It should not be a burden.

This is not a definitive article on the topic of preparing a scientific manuscript. Rather, it is an overview of my personal process for writing a paper. This process is dynamic, evolving, and has been guided by mentors and associates too numerous to name. Along the way, I have collected the following aphorisms guiding my manuscript preparation:

- there is no such thing as a paper that is too short
- write short declarative sentences; they contain more meaning than long convoluted ones
- all studies, no matter how complicated, can be simplified into a 2 × 2 table
- you have, at most, 60 seconds to get a doctor's attention, but only 30 seconds for a surgeon's

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- the purpose of writing a research manuscript is to communicate what you have learned to the reader
- don't make the reader guess your study purpose
- it is easier to write when you have something to say
- avoid passive voice; if this necessitates the use of first person, that's okay
- you treat patients and do research with subjects
- a good paper is one that you would like to read

A manuscript submitted for journal publication is not a thesis. A thesis is an often excessively long-winded document reviewed by a committee, bound, filed in the library, and usually never again seen. A scientific paper, by contrast, should be topically focused with clearly delineated observations and recommendations. Like other scientific papers, a patient-oriented research paper has 7 elements: title, introduction, materials and methods, results, discussion, conclusion, and abstract. The title has to grab the reader. The introduction should be short and focus the reader quickly and efficiently on the goals of the study. The materials and methods section needs to be only as long as necessary to cover the elements of the study. Writing the results section is straightforward, and more so if you do the tables first. The discussion is variable in length, but the structure is formulaic. The conclusion is short. Write the abstract last. It may be the only element of your paper the reader reads. Given the space constraints of most abstracts, it may be the most important and challenging aspect of the manuscript to write. Word count limitations for abstracts preclude wasted words.

ELEMENTS OF A PATIENT-ORIENTED MANUSCRIPT

Element 1: the title

The title should be short and entice the reader to continue to read. The abstract and introduction should grab and hook them, but more on that later. Consider

using a title composed of a declarative sentence or a question, rather than a technically correct but verbose title. For example, instead of “Mortality in Pharmacologically Treated Older Adults With Diabetes: The Cardiovascular Health Study 1989-2001” consider “Diabetes Is an Important Risk Factor for Cardiovascular and Other Diseases in Older Adults.” As another example, use for a title “Can Gene Expression Predict the Severity of Normal Tissue Damage After Radiation?” instead of “Analysis of Gene Expression Using Gene Sets Discriminates Cancer Patients With and Without Late Radiation Toxicity.” Also, do not be afraid to change your title. You may find that after writing the manuscript and internalizing the study, you will think of multiple, better titles and you can choose the best one.

Element II: the introduction

The purpose of the introduction is to provide enough information to hook the reader. The introduction is focused, short, and should be 500 words or less. The introduction should address the following questions: (1) Why is this clinical problem of interest? (2) What are the deficiencies in the current literature? (3) What is the purpose of this paper? An introduction composed of as few as 2 to 3 paragraphs should be able to answer these 3 questions well.

The most important part of the introduction is the paragraph summarizing the study purpose. The author must provide the reader a study purpose with sufficient specificity to avoid confusion and ambiguity. This is the author’s best—and possibly only—opportunity to share with the reader exactly what the paper is about and not leave it to the reader to guess. The *purpose* paragraph has 3 elements: (1) a statement of purpose, (2) a hypothesis statement, and (3) specific-aims statements.

I use 2 different techniques to state the study purpose. The conventional technique is to state the purpose literally: the purpose of this study is to measure the efficacy of prophylactic antibiotics in preventing postoperative complications in patients undergoing third molar removal. This conventional purpose statement, however, may leave ambiguity in the reader’s mind, such as what is efficacy, how will it be measured, and what complications will be studied?

An alternative approach is to state the research purpose in the form of a clinical question by using PICO, an acronym summarizing the following study elements: patient (P), intervention (I), control or comparison (C), and outcome (O). Using the aforementioned example, the purpose can thus be reformulated as a clinical question: the study purpose is to address the following question: among patients with impacted third molars

(*patient sample*), does the use of prophylactic antibiotics (*intervention of interest*), when compared with a placebo control (*control group or treatment*), reduce the frequency of postoperative infections (*outcome of interest*)? Restating the purpose in the form of a specific clinical question minimizes ambiguity and focuses the reader on the study’s goal. Almost all clinical studies (and literature reviews) can have the purpose stated as a clinical question. Even case series can easily have the purpose stated in the form of a clinical question, without the C component.

Compelling patient-oriented research is hypothesis driven. As such, the second element in the purpose paragraph is a hypothesis statement. Many times, based on the purpose statement, the reader can intuit the hypothesis. Personally, I do not like my readers to work that hard and prefer not to leave their impression of the hypothesis to chance. As such, articulate the hypothesis statement explicitly. Hypotheses statements can be formal or informal. The following are examples of formal hypothesis statements: (1) The frequency of postoperative infections in the treatment group equals (or does not equal) the frequency of infections in the control group. This statement implies a 2-tailed test of hypothesis. (2) The frequency of postoperative infections in the treatment group is lower than the frequency of infections in the control group. This statement implies a 1-tailed test of hypothesis. Less formal hypothesis statements can also be used: (1) There exists a set of 1 or more factors that can be manipulated by the clinician to improve implant survival. (2) Giant cell lesions are vascular tumors and treatment with antiangiogenic products can decrease the risk of recurrence.

The final element of the purpose paragraph is the specific aim(s) statement. Unambiguously, tell the reader what you did in the study. Specific aims commonly use terms such as measure, design, identify, implement, estimate, compare, or identify. The following are examples of specific aims:

- to measure the length of hospitalization in a patient sample undergoing orthognathic surgery and identify factors associated with decreased length of stay
- to estimate the 1-year survival rates of implants loaded immediately and of implants loaded in a delayed manner
- to compare the 1-year survival rates of implants loaded immediately to those loaded in a delayed manner, adjusted for correlated observations and important biologic variables (e.g., age and sex)

Element III: the material and methods section

Unlike the introduction, the materials and methods section may necessarily be long. It has a logical predictable structure that anticipates readers’ questions.

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