

Writing for Publication

Charles E. Henley D.O., M.P.H.
Professor and Chairman, Department of Family Medicine
Oklahoma State University College of Osteopathic Medicine

Faculty in medical schools have a significant duty to not only take care of patients, bring income to the medical school, and teach students and residents, but they must also demonstrate their value to the medical school and the university by participating in scholarly activity. The one best way the institution has of measuring the quality and quantity of that scholarly activity is by evaluating the publications associated with that work, and that individual faculty member.

Even though the scientific research paper is still the most common form of writing found in the medical literature, all publications do not need to be research papers. The purpose of this article is to examine the various options for medical writing, and discuss some of the features that make each form unique.

Topics to be covered include:

- Abstracts**
- Research papers**
- Review articles**
- Case reports, and special or brief communications**
- Editorials or Essays**
- Book reviews, journals and new media reviews**
- Newsletters**
- Correspondence**
- Practice guidelines, or consensus statements**

We will discuss the structure and methods for each of these forms of writing, and provide some generic writing tips and rules for good medical writing.

Abstracts

The specific rules for abstracts will be detailed in the instructions to authors found in the journal you are hoping to be published in. Some journals require key words to be listed and explained, as well as a detailed synopsis of the paper, including results. Others require the author to provide a general, and brief synopsis. There are opportunities to publish an abstract by itself in certain journals where the purpose is to provide an

overview of a research competition, or the results of grant awards for a given year. An example would be the JAOA issue of abstracts published annually by the AOA Division of Research.

An abstract is a brief synopsis of the paper that allows the reader to quickly understand the contents and meaning of the work, and needs to be written concisely and clearly. Abbreviations and acronyms should be avoided unless first spelled out. There should not be any direct quotes or citations and the abstract should be written in the active and not the passive voice. The present tense should be used to describe results, and the past tense for descriptions of variables being studied. Abstracts of clinical research should probably not exceed 250 words and should adhere to the format of **purpose**, where the hypothesis of the study is stated, **design**, where the basic design of the study is described, **setting**, which can determine the generalizability of the study, the study **population**, where issues such as eligibility and exclusion criteria are discussed along with how patients were selected, and the **intervention, outcome measures, and results**, which should be accompanied by statistical significance, and confidence intervals. The **conclusions** that are directly supported by the evidence should also be described, although there will not be any discussion. Abstracts written for case reports should also not exceed 250 words, and should include an **objective**, a brief description of the **case**, followed by an equally brief **conclusion**. The objective should be stated precisely in one or two sentences, and the case presentation should be clear and definitive, without any extraneous information. The conclusions, although brief in the abstract, should describe how and why this illustrative case, and its associated findings and management principles, would improve patient care. A more complete discussion of these issues will be found in the body of the paper.

The research paper

Once the research project is completed, the investigator / author has already answered a few of the questions surrounding the finished work, such as “is the research worth doing, and has it been done before?” The research may be of considerable importance to you, but may still be in search of an audience. It is therefore important to ask the question, “who is my audience, and who cares if I write this paper”? Do not make the mistake of sending a finished paper to a particular journal because you think this is the audience who *needs* to be educated about a particular outcome. Try to match the topic to the journal and the audience. For help in making these decisions, the Medical and Scientific Authors Guide lists over 500 journals by subject, with the main section reproducing the journals’ information- for- authors pages. Journals often categorize research papers into Original Articles, Original Contributions, or Original Reports. Short articles that occupy only two or three pages are often categorized as Brief Reports.

Once you start to write, the standard format for research articles would be IMRD, **introduction, materials and methods, results, and discussion / conclusions**. The introduction describes the research question, how this study will add to the understanding of the topic and related field, and then the focus of the study itself. If the introduction is too long the readers will get bored or refuse to continue on with the remainder of the

paper. If it is too short, it may not be descriptive enough and the reader will be confused about the meaningfulness of the data. The methods section describes how you carried out your research, and should follow a logical sequence of describing the study design, the condition being studied, the subjects or population being studied and their manner of selection, the intervention, the outcomes being measured, or observations made, and the statistical treatment of the data that tests the hypothesis. It is helpful to describe these areas as they relate to the original research question. The methods section should answer all questions about what you actually did, and how you did it. The results section is where the answer to the research question can be found. The results section is not the place to discuss the importance of specific outcomes, just as the discussion section is not the place to present new data. The data that make up the results section should be presented in a factual way, and should clearly and logically reflect the methods used. This includes demographic and descriptive data, and data generated from hypothesis testing such as *p* values and confidence intervals. Often, the use of tables or figures can be used to present data in a way that is efficient and understandable. The conclusion and discussion of the study is where one can argue their case about what the study results demonstrated, as well as their significance.

The Case Presentation

The individual case report still has a place in the literature as long as it can satisfy the need to provide an illustrative case that by itself can demonstrate unique findings or management principles that can be generalized and used to improve patient care or the collective data base. Case reports may also be published under the heading of Clinical Observations, Special Articles, or Special Communications. Because the scientific value of a single case report is considered to be of limited value, some journals prefer to see them published as letters to the editor or Grand Rounds. The structure of the case report should include an objective, which is a concise statement about why this is an important case to present. It should be followed by the actual case presentation itself, which should include all relevant data, but should avoid unnecessary information that is not pertinent to the case. There should then be a discussion of the case, which puts the case into proper perspective. The discussion should cover how this case is similar or different from other cases in the literature, what alternative explanations may exist that could explain the findings, and how the case may contribute to improving patient care, or our knowledge of disease processes. The conclusion can also bring up possible implications of the case, such as how this would change the way clinicians should view patients with these or similar clinical findings.

Review Articles

This is probably the most widely read form of publication and requires a thoughtful, and rigid adherence to fact and accuracy, devoid of personal bias. This is due to the large number of clinicians who regard the information in review articles as guidelines and a basis for treatment. In choosing a topic for a review article, try to use common problems that would be of interest to most readers, and could potentially influence clinical practice.

Avoid topics that only have curiosity value. The Clinical Review Article is an update, which selectively reviews the literature and discusses a topic broadly. The Systematic Review Article represents an evidence-based approach to reviewing a topic by comprehensively examining the literature in a very structured way to identify specific relevant information that would demonstrate consensus on diagnosis or treatment of a disease. Meta-analysis is one form of a systematic review, which uses rigorous statistical methods to examine several journals to answer a single question. Like the research paper, the review article is making an argument for a particular treatment approach or conclusion. The best clinical review articles base their arguments on other systematic reviews. A well conceived review answers a question or closely related questions, such as “what is the best form of weight loss for lasting results?” The question should be stated clearly in the introduction. Although the clinical review article might not have a classic methods section like that seen in the research paper, it should still describe the literature search, the data -bases, and bibliographic indexes used. The bibliography should not go back more than five years unless the older articles offer significance insights from a historical perspective. The systematic review will have these as well as a description of the methods used for analysis, including the statistical treatment of the data. The body of the article is the descriptive review of the subject. The conventional sequence of information for the review article is etiology, pathogenesis, manifestations, diagnosis, treatment and prognosis. Manifestations include the clinical and laboratory observations of the topic being reviewed.

When writing clinical review articles remember to define the relevance of the topic in the introduction. Also, include a table of CME objectives, state how the literature review was accomplished and what sources were used. Acknowledge other viewpoints from the literature, as well as recent developments, or conflicts of interest. Highlight key points about diagnosis and treatment, and include a summary of key take-home points. Use tables, figures, and illustrations to summarize data, and highlight key points and use a step –wise, logical approach to presenting diagnosis and treatment. Emphasize evidence-based guidelines and primary research studies instead of other review articles, unless they are systematic reviews.

Editorials / Essays

These are articles of opinion, or short essays that express a point of view. The task is to fit what you have to say into relatively few words, but still give it meaning, as well as a clear and logical sequence. The essence of the editorial is critical argument, where the author takes a particular stand on an issue, or question. The author must then pose one or more possible answers, and then weigh the evidence supporting either argument. An example might be an editorial on screening for colorectal cancer and the utility of using heme - occult cards and flexible sigmoidoscopy, versus full colonoscopy. The argument would entail a discussion of the cost analysis of the two procedures, the ease of use and patient satisfaction, and the overall reduction in morbidity and mortality. The conclusion may be that there is no answer, but that in itself can be illuminating. An editorial can also be informational in nature and use data to make a point, especially if the author is trying to argue for a particular agenda. Occasionally an editor will invite someone to write an

editorial opinion about an article appearing in the same journal. This invited editorial expresses an opinion about the results of the other article and the generalizability of the data, or the significance of the topic. Normally editorials are invited, although an unsolicited editorial opinion, or essay, may be published if it fits into the editorial policy of the journal and reflects some timely topic. Sometimes, an opinion essay might be published under Commentary, Sounding Board, Viewpoint or Controversies. The typical structure of an editorial follows the format of **statement of the problem, evidence in support** of either opinion, **counter arguments** and evidence, and an **assessment of all the evidence** and then the **final conclusion**. The closing paragraph should provide a strong answer to the question posed in the opening paragraph.

Position paper

This is a variant of the editorial, but may take a position that is too controversial to be given space as an editorial. It usually is longer than an essay or editorial, and takes one particular position and exploits the data to drive home a particular point.

Correspondence (letters to the editor)

The international committee of medical journal editors has recommended that all biomedical journals have a section carrying comments, questions, or criticisms about article where the original authors can respond. This is the letters to the editor section of the journal, which often provides a useful interchange of ideas and comments about article being published in the same journal. If writing a comment about an article published in the same journal, that article should be cited in the beginning of the letter so the reader will know why the letter is being written. Letters to the editor may also report research data, describe a case, or express an opinion. In most cases the letters to the editor are subject to the same level of scrutiny as original research articles. In fact, some letters are miniature research reports, case reports, or reviews, and having bibliographies. These may also require the author to sign a release form.

Book Reviews

A good book review has no less structure than an editorial, and are usually invited by the journal editor. The review opens with a question, and then goes on to discuss evidence and counter evidence for an opinion about the book or other media being reviewed. Ideally, the book review should give the reader an overview of the book or product and an assessment of its quality, especially whether or not the book fits a certain niche, or is even needed. The reviewer should include try to include reasons or supporting data for the opinions expressed about the book or media presentation. Ultimately the reader wants to know if they should get this book. They will want to know if the book is better than others of its kind, was it understandable and enjoyable, did it meets its goal, and is it written for the right audience. More importantly, they want to know if they should buy the book, or use the product. The authors' recommendation is always the last thing in the review, and carries significant weight. It is one of the reasons that this type of review article should not be taken lightly.

Others

Some forms of writing do not fit well into any category within the framework of a journal. The personal reflections in A Piece of My Mind, in *JAMA*, is this type of article, which is actually a form of the essay. Other forms of writing that are commonly seen in journals include news articles, conference reports, poetry and obituaries. Authors should examine several issues of a journal to ensure that a submission is appropriate.

Suggestions for Writing

If writing were easy, everyone would be doing it. Actually, almost everyone is doing it, the trick is to do it well. There are a few concepts that can help improve your chances of having a readable manuscript. Initially, the goal is to write a first draft. This is where the author must make a commitment to writing, and is probably the largest hurdle to overcome. In attempting the first draft, the author should find a quiet place to work, and block out an appropriate length of uninterrupted time, usually three to four hours at a minimum. Do not write when you are tired, and make sure that all of the reference material you will need is available. It is also important that you have an idea of the audience you want to reach, and the journal you want to be published in, (remember, there is a place for every article). Please take the time to first read the information to authors that is included in almost every copy of every journal. This will give you invaluable information about the journal's editorial policy, how they want the tables to look, how to do the footnotes and bibliography, what font to use, and whether or not it needs to be double spaced, (it will). Writing a preliminary outline of the paper will also help focus the mind on the content and structure you want, and help develop the central themes.

To help you get started, try writing the easiest part of the paper first. For most articles this will be the straight- forward materials and methods section, where you tell the reader what you did and how you did it. After the Methods section try the Results section, then the Discussion, and then the Introduction. The last thing should be the abstract that synopsis the entire article into a brief paragraph or two. At this stage of writing, the goal is to get everything out and onto paper. The issue of good grammar and sentence structure, with a lead sentence for each paragraph and agreement of subject and verb will come later as part of the development of the actual paper. At this stage you do not care about a finished article, or even correct spelling, all that will come later. All you care about for now is writing everything down. It should be a rush and flow of ideas and concepts that continue until you exhaust your ability to think of anything more to say. Continue to write without stopping, putting ideas in when you think of them. There will always be more information, more words and more data than you can or should use. But somewhere in that flood of words there is a paper that will be refined as you edit. After writing the first draft, it is a good idea to take a rest from writing for awhile. When you come back to the article start to look at it with a critical eye for content, flow of ideas, paragraph and sentence structure, and how the tables and figures will fit into the

text. A general rule is that if an idea can be easily presented in a table or figure, then the legend under the graphic and the graphic itself should be enough, and no other explanation in the text is required except for a reference to the table. This process of revision will reduce the size of the draft considerably.

After one or two revisions, the author should break from the writing process and give the article to someone else to read. This is not for content, but to see if the writing is understandable and readable. Your high school son or daughter would do nicely, if your ego is strong enough. As you write what you hope will be the final draft, try to put yourself in the role of someone picking up a journal and reading the article for the first time. Would the abstract catch their interest, and compel them to want to read the remainder of the article? Is the article readable, does it tell a story? Does it make its point? Does it raise or state the question appropriately, and do the results and conclusions support the data and answer the question? Does the article stimulate thought? Also consider the amount of time you usually spend reading an average article. Most authors make the mistake of being too inclusive, and writing too much. Make every attempt to keep the article to the minimal length necessary to make your point. Some journals will have a word count, especially for the abstract, and the length of the manuscript is one of the more common reasons for editors sending the manuscript back to the authors for revision. This does not mean that the authors should leave out important or significant information or data just for the sake of brevity. This represents the art of writing, the ability to convey critical information to a reader in a concise and informative way.

As you write, a helpful hint might be to think of how you would present this paper at a conference in a brief presentation, usually ten minutes. What would you need to say that would convey the essence of the article or concept? This will focus your attention on how the paper needs to be organized in order to emphasize key concepts and provide clarity of purpose. Then think of the professorial type in the back row with the glasses and bow tie who raises his hand at the end of the presentation and says, “Yes, but....”. Writing, like life in general, is full of yes, buts. But unlike life, there is a backspace key on the computer. By the way, remember to save as you go.

Bibliography

Submission guidelines for abstracts for clinical research, case presentations, and posters. The Uniformed Services Academy of Family Physicians (USAFP), 2003

How to Write an Evidence-Based Clinical Review Article, Siwek, J. MD, Slawson, David, MD, Shaughnessy, Allen, Pharm.D. American Family Physician, Jan.15, 2002.

How to Write and Publish Papers in Medical Sciences. E.J. Hugh, Philadelphia ISI Press, 1990.

How to Write and Publish a Scientific Paper. R.A. Day, Philadelphia ISI Press, 2nd. Ed., 1988.