

HOW TO WRITE A CASE REPORT FOR PUBLICATION

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ABSTRACT

Objective: This paper describes how and why to write a case report for publication in a peer-reviewed journal.

Methods: PubMed, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), and the Index to Chiropractic Literature were searched from 2000 through September 2006 using the following search terms: case report, authorship, peer review, and manuscript. Relevant manuscripts were retrieved and the results were used to update a previous narrative overview of the literature.

Discussion: Commensurate with the increased use of evidence-based health care and recent changes in publication requirements, new standards are expected of case reports. Case reports should present new information to the literature and be written succinctly. The types of case reports available are discussed. Steps for preparing a case report are described based upon the current available literature.

Conclusion: Case reports are important contributions to the health sciences literature. Proper preparation of this study design is necessary in order for it to be published. A self-evaluation check sheet for authors is included to assist in the writing process. (*J Chiropr Med* 2006;5:72–82)

Key Indexing Terms: Case Report; Authorship; Peer Review, research; Manuscripts.

INTRODUCTION

The clinical case report, which describes and analyzes the diagnosis and/or management of 1 or 2 patients, is the first line of evidence in health care.^{1,2,3} Case reports have been used for years as a means to teach health sciences students,^{2,4} are one of the best ways for authors to get started in scholarly writing,^{2,5,6} and can be a valuable learning experience for both author and reader.⁷

As valuable as the case report might be, many journals no longer publish this study design for a variety

of reasons. Past abuses in authorship² culminated in the demise of the case report in some journals. Some journals no longer publish cases because of the low level of general application to the practice of evidence-based care since case reports have certain inherent limitations.^{2,8,9,10,11} Some cases add little to the body of scientific knowledge and this is cited as a reason for discontinuing the publishing of cases.¹² Other factors include the limited page space within a journal that tends to be dedicated to experimental studies, and the diminutive effect case reports have on a journal's impact factor.¹³ Thus,

those journals that do continue to publish case reports are receiving more of them, and if one desires to see his or her manuscript grace the pages of a peer-reviewed journal, it needs to be of high quality.¹⁴

Getting a case report accepted for publication in a journal does not have to be difficult. Many troubles can be avoided by knowing the requisite properties and parts of a publication-worthy case report^{15,16} and having an understanding of the peer review and publication process. This article discusses reasons for writing a report, the styles of reports one may write, the limitations of case reports, and culminates with a step-by-step description of preparing the case report. A pre-submission check sheet is included to assist in the writing process. It is our intention to make the writing process more enjoyable for new and seasoned authors alike.

METHODS

This article is an update on an earlier paper that was created using a comprehensive review of the literature through mid-year 2000.¹⁷ Because much has changed in the requirements for case reports, we felt it was appropriate and necessary to update the previous review. For the current paper, we searched PubMed, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), and the Index to Chiropractic Literature for the years 2000 through September 2006. Search terms included the following words: case report, authorship, peer review, manuscripts. Relevant manuscripts were retrieved and further sources were found by reviewing related links provided in each database and by reviewing the references of the papers read. The results of the current literature review were then used to update our previous publication using a narrative overview of the literature.

DISCUSSION

Why Write a Case Report?

The increased value placed on science as an underpinning for health care in the era of evidence-based health care has certainly placed the randomized clinical trial at the top of the hierarchy for reliable health information that may be used in a health care decision.¹⁰ In this hierarchy, case reports are at the bottom, existing as descriptive reports and opinions of respected authorities.¹⁰ Thus, one may ask, is

there a place for case reports in the scientific literature?

Many authors agree that case reports have their place in the published literature, and they should be written because they provide new knowledge to the field of health care.^{1,14,18,19} Cases remain as one of few ways to bring a new condition or new etiology to the attention of the scientific community.^{9,11} For example, in 1985, the American Medical Association reprinted 51 papers from the *Journal of the American Medical Association* that had significantly changed the science and practice of medicine during the 150 years of the organization's existence. Interestingly, 5 of these papers were case reports.²⁰ While case reports can be highly influential on their own merit, they may simply provide documentation of occurrence,³ which provides preliminary evidence necessary for designers of larger scale experimental studies^{1,21,22} or warns a profession of potential complications of care.⁸ A list of reasons to publish an interesting case is provided in Figure 1. Grimes and Schulz²³ suggest that cases worth reporting have not been studied before.

There are additional reasons to write a case report. For instance, authors, students, and readers usually find case reports to be educational and interesting.^{2,7} Additionally, students may present a case in grand rounds and the next step in professional growth would be to get the case published.⁹ Furthermore, practitioners can report unique cases from their clinical practice to add to the evidence base.^{1,15,16,18,21} Lastly, the act of writing a report provides an opportunity for one to practice concisely written communication, to learn about a topic, and to think critically.^{2,8} While these secondary reasons are all noble, if a case does not add new knowledge, then there is little likelihood that the manuscript will be accepted for publication.

Types of Case Reports

Since case reports are typically educational and relevant to practice, there are 3 types that tend to be published, including diagnostic or assessment reports, treatment or management reports, and educational reports. Diagnostic case reports describe and discuss the diagnostic or analytic methods used to evaluate a patient. These cases present a diagnosis that is rare, confusing, or difficult to render, but often do not discuss treatment.^{18,26} Other case reports describe and discuss the full management of

1. To present an unusual or unknown disorder^{1,9,14,21,23}
2. To present unusual etiology for a case^{1,9}
3. To present a challenging differential diagnosis¹
4. To describe mistakes in health care, their causes and consequences^{1,3}
5. To describe an unusual setting for care¹
6. To present information that can not be reproduced due to ethical reasons^{1,21}
7. To illustrate a clinical hypothesis¹⁸
8. To prompt a new hypothesis^{16,18,21,23}
9. To disconfirm an hypothesis²⁴
10. To support an hypothesis^{16,18}
11. To stimulate further research¹⁸
12. To make an original contribution to the literature^{21,24}
13. To offer new insight into the pathogenesis of disease^{5,16,24}
14. To describe unusual or puzzling clinical features^{3,5,16}
15. To describe improved or unique technical procedures^{5,15}
16. To describe the historical development of a field or movement²⁵
17. To report unusual drug-drug, drug-food, or drug-nutrient interactions³
18. To describe rare or novel adverse reactions to care^{3,11,14}
19. To study the mechanism of a disease^{9,14}

Figure 1. Reasons for submitting a case report for publication.

a patient, including how the patient is assessed and managed, providing the reader with an in-depth understanding of the case. Educational case reports are used to provide readers with current practice strategies while providing a brief review of the literature. While the case used to frame the educational experience may not be new, the manner in which the article is written should provide a new perspective on the topic under study. Some journals use such case reports as a medium for continuing education. Although such a case may be a clinically relevant form of continuing education, such cases are falling out of favor since they often do not contribute new knowledge to health care.¹⁹

Case Report Study Designs

While the section above suggests what case reports present, study designs determine how the information is presented and how the case information was collected. Essentially, case reports may be retrospec-

tive or prospective in nature, the latter being more rigorous in its design.

The retrospective design is most commonly published.¹⁸ This is the simplest form to write and is an excellent design for the beginning author. One of the potential weaknesses of retrospective case reports is that authors may very well provide the best care possible while managing a case, but may not use the best outcome measures available to document any real change in patient health. This detracts from the credibility of the report, undermines its usefulness, and is something that can be avoided with some early planning.¹⁸

With prospective case reports the author plans out patient care and data collection ahead of time. For example, a practitioner may frequently care for patients with migraine headache. In preparation for writing a case report, the doctor reviews the literature to determine the best outcome measures to assess patient progress and determines how or if a case will contribute to the literature. Published treatment protocols are also discovered during literature review and will be used once the next patient presents with the condition. When the next case does arrive in the office, the clinician knows ahead of time exactly how to evaluate the patient and will deliver a specified predetermined management plan. Measurements of the patient's condition are taken before, during and after care and can be tracked over time. Some authors avoid this type of case report because of the work involved in planning the case. However, it saves an inordinate amount of time in the writing of the manuscript because the literature already has been reviewed. An added bonus for the patient is that the early planning and preparation for this case report improves the patient management in practice.

A special kind of prospective design is the time series case report. In this design, a clinical hypothesis is generated by the doctor, tested over time, and documented with valid outcome measures.^{27,28,29} Each part of the study is broken down into phases³⁰ and a minimum of three measurements are taken on the patient's condition during each phase, thereby decreasing the likelihood that an inaccurate measurement is taken. Taking a series of 3 measurements also helps the author identify the trend of the patient's condition, something that can not be accomplished if only one measurement is taken before and after care, which is typical in retrospective and

prospective case reports.^{18,31} Authors interested in the time series case report should insure that the study is approved in advance by an ethics review board or referred to other resources that thoroughly describe how to conduct a time series case report.^{18,26,28}

Limitations of Case Reports

While case reports are a valuable contribution to the literature, it must be kept in mind that they have certain limitations.¹⁰ First, the management of patients in an out-patient setting occurs primarily in an uncontrolled environment.²³ There is little the clinician can do to prevent patients from introducing a variety of confounding factors into their lives that may affect the patient's response to care; clinical results may not be due to the treatment rendered.¹⁰ For example, a patient may take pain relievers, lift a heavy object when not in the office, and may exhibit various levels of compliance with care, all which have an impact on the clinical picture seen by the clinician at the time of an office visit.

Because of these uncontrollable factors and the fact that the care rendered to one patient may not produce the same effect in another patient, case reports cannot be generalized beyond the context of the patient reported.^{10,21,30} This means that one can never conclude, based upon the observations of a single patient, that any particular management strategy will be effective for other patients with the same condition.²⁷ One can hypothesize patient response, but it can only be tested using experimental clinical trials. However, authors of case reports may be encouraged to know that more elaborate experimental trials may be based on the very case reports that they write.

Results of patient responses to care are also limited by the natural history of the disorder under study. Some disorders may undergo spontaneous remission or phases of exacerbation and remission.³⁰ Often times, one of these phases may correspond with the time when care is provided and could lead to a faulty conclusion. For example, a patient with chronic adhesive capsulitis may begin care at the peak of exacerbation. If the patient improves, it is difficult to determine if the patient improved because of the natural tendency for the capsulitis to enter remission or the condition improved because of the care rendered. Similarly, if the patient begins

care just prior to the worst part of the inflammatory cycle and gets worse during care, it could seem as though the care actually worsened the condition when in fact it may be the natural process of the condition. Therefore the natural history must be kept in mind when managing patients and writing a report.

Lastly, when constructing a retrospective report, the author must rely upon data accumulated in the patient health care record. Since such records often are not complete, important data may be missing, which introduces a source of error into the report.¹⁰ Thus, those who maintain more detailed and accurate records are more likely to find it easier to write better case reports.

Writing the Case Report

A successful clinical case report should include the necessary design elements, be well structured, and convey a clear message.^{1,15,16,21} Elements of a case report are similar to those required for all forms of scholarly articles and we provide a suggested list in Figure 2. There are a few approaches to use in presenting a case report, from the "storied case report"³² to the evidence-based case report,¹¹ however the traditional format is what we present here. Authors may find that worksheets and checklists^{3,4,33,34} are helpful in preparing a case report.

Most seasoned authors and editors would agree that the most important thing an author can do to enhance the chance for acceptance is to follow the journal's instructions for authors when preparing a manuscript.^{2,7,35,36} There are 2 sources of instructions for manuscript preparation that one should follow. The first are the instructions for authors of the journal to which one desires to submit a manu-

1. Title
2. Structured abstract
3. Introduction
4. Case report (methods and results)
5. Discussion
6. Conclusion
7. Acknowledgements (if applicable)
8. References
9. Tables
10. Figures and captions

Figure 2. Case report components listed in the typical order of appearance for a manuscript being prepared for submission.

script. These are usually available from the journal editor and posted on the journal website. Almost all biomedical publications follow another set of guidelines, the *Uniform Requirements for Manuscripts Submitted to Biomedical Journals*. These guidelines describe in detail how to prepare a manuscript for submission to a peer-reviewed journal. Conforming to these guidelines is essential to insure that submitted manuscripts are uniform in nature to increase one's chances of acceptance. The *Uniform Requirements* can be found on the Internet at <http://www.icmje.org/index.html>. Thus, when formatting a paper, authors should be sure to satisfy both sets of instructions before submitting a paper. Manuscripts received by journals are often returned to authors immediately because they are not formatted correctly, a problem easily remedied by following the directions.

The presentation of a case report should be objective and devoid of fantastic claims or far reaching conclusions.^{2,3,15,16} It is essential that authors remember that the intention of a case report is to describe and discuss a clinical event, not to prove anything.¹⁸ Keeping in mind the major limitations of the case report design, one should avoid writing a case report that tries to prove causation and observations of the case should not be generalized to other patients.^{10,11}

Authorship

Determining who will be listed as authors on a paper, and in what order, is an important process. It is convention that the author who does the most work on the project is listed first and only those involved in a substantive way are listed as authors. Past abuses in authorship have created a need for clear authorship criteria, which have been provided by the International Committee of Medical Journal Editors.³⁷ Since it is unlikely that a single case will be managed by a large team of providers, one would not expect to see more than a few authors on a case report. One paper titled "*Does it Take a Village to Write a Case Report?*"³⁸ poignantly demonstrates that some have successfully used the case report as a means to enhance their curriculum vitae. One study has objectively demonstrated that case reports contain too many authors.²

According to the International Committee of Medical Journal Editors guidelines, one may only be considered an author only if he or she meets all of the following 3 criteria: 1) has provided substantial

contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) has drafted the article or revised it critically for important intellectual content; and 3) has given final approval of the version to be published.³⁹ Anyone who does not meet all 3 criteria, but who has contributed to the paper, may be thanked for their contribution in the acknowledgements section of the manuscript.^{2,39}

Patient Privacy

Case reports tend to report on unusual situations and patient identity may be compromised because of the unique qualities of a case.^{8,9} Further, in the United States, the Health Insurance Portability and Accountability Act (HIPAA) requires that patients' protected health information be secure.⁴⁰ Before 2003, when HIPAA came into effect, patient consent to publish the case was not well observed.⁴¹ Because of these issues, many journals now require authors to obtain consent to publish from patients prior to publishing a case report^{8,9,14,42,43,44,45,46} and some journals require that the patient sign a specific consent form provided by the journal office.¹⁴ If a patient refuses to allow the information to be published, authors should respect the patient's wishes.⁴⁷

If an author works for a hospital or institution, he or she should inquire with the institution's privacy officer or institutional review board to find out the institution's practices regarding patient privacy before submitting a manuscript to a journal.^{14,42,46} Prospective case report designs pose a special challenge. Since they inherently involve the premeditated planning and application of care, especially in the case of the time series design, authors should receive expedited review from an institutional review board prior to conducting the study. Summarily, it is common practice that journals will not accept a manuscript if it is unaccompanied by consent to publish the case from the patient or approval from an institutional review board or privacy officer⁴⁸ or if all identifying information has not been removed during the preparation of the report.^{8,9}

Length

The literature we reviewed varied in its description of the expected length of a case report. Suffice it to say that case reports should be brief.² Some journals impose word limitations on case reports;¹⁴ 1500–2500 words are recommended by Cohen.³ In a review of several top journals, Sorinola et al¹⁴ found

word restrictions to be between 500 and 2000 words with a median of 1000 words. Authors should verify that the length of their case report does not exceed the word count recommended in the journal instructions for authors.

It is essential that the author deliver a single message, based on the actual case presented and to not tangent.² It is increasingly common for journals to not allow case reports to be used as an instrument to review the literature.^{2,3,9} Combining a case report and a literature review usually yields a lengthy and poorly executed hybrid. Modern literature reviews are important designs used in the application of evidence base health care and have a specific purpose and style. Therefore, case reports and literature reviews are separate study designs and should be published as such.⁹

Title

The title should be an accurate, succinct description of the patient under study.^{15,16} Janicek¹ suggests that 4 items be included in the “informative title” to enable rapid identification of the topic presented.¹ These 4 items and an example are included in Table 1. Writers should not use titles that suggest a large-scale trial was conducted because they are misleading to the reader. For example, *An endurance training regimen improves low back endurance associated with low back pain* presents the case as if more than 1 patient was studied in a clinical trial for effectiveness. Clever or artistic titles (eg, *Stamina in the Office Worker*) should not be used unless they are a subtitle because it is confusing and makes it difficult for the reader to determine the focus of the paper.

TABLE 1
FOUR ELEMENTS FOR THE INFORMATIVE CASE REPORT TITLE. THE RESULTANT COMBINATION OF THESE ELEMENTS COULD BE THE FOLLOWING TITLE:
CHANGES IN ISOMETRIC LOW BACK EXTENSION ENDURANCE TIMES AFTER AN ENDURANCE TRAINING REGIMEN IN AN OFFICE WORKER WITH LOW BACK PAIN

ELEMENT	EXAMPLE
1. INTERVENTION IS NAMED.	ENDURANCE TRAINING REGIMEN
2. OUTCOME OF THE INTERVENTION IS IDENTIFIED.	CHANGES IN ISOMETRIC LOW BACK EXTENSION ENDURANCE TIMES
3. POPULATION UNDER STUDY IS IDENTIFIED.	OFFICE WORKER
4. THE CONDITION OF INTEREST IS STATED.	LOW BACK PAIN

Abstract

The abstract is a summary of the article and offers the reader an organized, brief presentation of the paper, relating the most important highlights of the case. Abstracts are important; the information in the abstract and the title are entered into computer databases and indexing systems, and are essential for those conducting literature searches.^{2,3} A well-written structured abstract allows people searching the literature to find the information they are searching for and to discern whether or not they should retrieve the paper.^{1,49}

Abstracts should be short (100–250 words).³ In the past, narrative abstracts were often used by journals, but authors sometimes did not adequately report the necessary elements of the study in the abstract. Thus, most journals adopted the structured abstract format over 15 years ago.^{49,50} There is wide variance in the subsections required by journals.⁴⁹ The instructions for authors for the journal to which authors are considering submitting their work should be reviewed for instructions pertaining to word count and structure. The most general structured abstract includes the following: introduction, methods, results and discussion.⁴⁹ More on the content of these subsections can be found in Figure 3.

Introduction

The purpose of the paper should be clearly described in the introduction.^{3,16,24} In addition, background information should be provided to demonstrate how the case contributes to the literature.³ Information from a review of the literature allows the author to relate the context of this case in relation to previously published data.^{15,16,24} For example, the incidence of the disorder, the number of previously reported cases, or other information that helps provide context for the case could be provided. While it is important to provide enough background information to put the paper into context and establish the need for the paper, it is also important not to delve too deeply in to the subject.⁵¹ It is essential that the author’s preparation for writing the manuscript include a comprehensive review of the literature;¹⁶ however, it is important to limit the amount of information in the introduction only to what is adequate to familiarize readers with the topic. In the introduction, the author should also define unusual terms or words that are essential to understanding information in the paper. For instance, if a case is

Introduction

- Clearly state the purpose of the paper

Case Report/Methods

- Present the most salient parts of the case presentation
- Focus on the primary aspects of the patient's condition and the main outcome measures used to track patient progress prior to delivering care
- Briefly describe methods used to care for the patient and/or assess the patient's status

Results

- Briefly summarize outcomes of care, including changes in the primary outcome measures.

Discussion

- Summarize what the case contributes to the literature
- Do not summarize the previous sections of the abstract
- State the overall conclusion learned from the study

Key words

- Use terms found in the *Index Medicus* database, which are called medical subheadings (MeSH). MeSH can be found at the PubMed home page (<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=mesh>)
- List additional words that may be unique to the case or to the profession

Figure 3. Standard subsections of the case report structured abstract.

about phantom limb pain in a disabled athlete, it would be necessary to briefly define phantom limb pain and describe the athletic activity in which the disabled patient participates.

Case report (methods and results)

The part of the paper that describes the patient, outcome measures, assessment protocols, and treatment, if applicable, is sometimes called 'case report' or 'case presentation' in various journals. While this may seem confusing because the study design being used is essentially named the same, it is simply the part of the manuscript where the author describes how the patient was managed. It is important in this section to provide a detailed description of the case and management for a number of reasons.³

First, the reader should be provided sufficient information to understand the how the patient was assessed. Since other clinicians will read the paper, it is important to describe procedures in a clear manner so that other doctors may be able clearly understand the protocol.⁵¹ Third, it should describe the case in chronological order and with enough detail for the reader to establish his or her own conclusions about the validity of the case.³ Also, if future research will be based on this case report, researchers will need to have accurate descriptions from which to work. Photographs or illustrations of diagnostic procedures, radiographs, or treatment procedures can be helpful in conveying a clear message to readers and should be used when appropriate. However, authors should be judicious in their use of illustrations or figures, including only those that enhance clarity of the case presentation.

An extremely important part of the case report section is the reporting of patient data. It is important that all appropriate tests are ordered to confirm a diagnosis and provide a platform for a reliable publication.⁸ Primary outcome measures should be used that quantify the patient's problem. Quality sources of data such as the visual analog pain scale,⁵² functional outcome measures (eg, neck disability index⁵³), vital signs, results of laboratory tests or imaging and other outcome measures provide more objective information than reporting that the patient had "severe pain", was "disabled from a neck injury" or "had hypertension". Other clinical information that may be difficult to quantify, such as nausea or dizziness, should also be reported. However, it is difficult to determine from this information how much clinical change occurred.¹ Negative results should be restricted to those that are significant in their relation to the case.¹⁶

The methods and results should report the outcomes of the management as measured by the primary outcome measures and other data. It should be concise and not contain any inferences from the author as to why the patient's health situation may have changed. Inferences should be saved for the discussion section. Since it is often laborious for readers to sort through data embedded in paragraphs, tables that demonstrate before and after care measurements may help the reader better understand the outcome. Balanced against the need for enough information to establish the credibility of the case is the need for authors to be concise and to include only the information needed to convey the

case. Authors should refrain from providing confusing and superfluous data, such as daily vital signs reported as normal, routine laboratory tests, etc.³

Discussion

The discussion is the part of the paper where the author explains and discusses the case and provide his or her opinion, thus opinions should not appear elsewhere in the paper.⁵¹ The discussion should compare the case with the published literature, evaluate the case for accuracy, and derive new knowledge and/or applicability to practice.³

Comparing the case to what is already known and to similar cases reported in the literature demonstrates the unique qualities of the case reported and the author's vigilance in conducting a thorough review of the literature in preparation of the report.^{3,15,16,24} Salient differences between the case and what is known in the literature should be presented; authors should not report variance that is inconsequential. Wright and Kouroukis⁵⁴ have presented a manner in which authors may use to search the literature for other pertinent cases or information. They suggest performing a broad search to garner as much as possible about the condition and also to search the literature by combining the topic in question with the search term "case report". This helps to discover if the case is indeed unique (and should be published), identifies specific criteria necessary to confirm a diagnosis, and reveals any standards that may exist in treating the problem.⁵⁴

The author needs to demonstrate that he or she is objective in a self-assessment of the case. A discussion of how the diagnosis was confirmed and the differential diagnoses considered establishes that the author fully understands the problem and provided an adequate evaluation. A rationale for the management of the patient may also be provided,¹⁵ especially if patient management could be considered controversial. If a previously published protocol was used to see if it would have an effect on the patient, this alone may be adequate. However, if there are other reasons for selecting one procedure over another, the rationale should be presented. The author should list the limitations of the case and describe the significance of each limitation.³ In addition, faults in the case or quality of reporting should be identified. Authors must include in the discussion other possible reasons for the outcome of the case,

such as the natural history of the disorder or other factors. Since the case is subject to many unknown variables, the author should present some of these to the reader.^{16,24}

The writer should provide suggestions or hypotheses regarding the significance or outcome of the case and why the care provided may or may not have been beneficial.^{8,24} Support from referenced materials is valuable and should be included. A final element for the discussion is some suggestion for future inquiry into the topic.¹⁶ Stating that "more research is needed" is inadequate.²⁴ Prompting a specific directive for future patient care guides research and clinical endeavors. Authors write this section by integrating what they have learned from the case and the literature that is reviewed in order to prepare the manuscript.

Conclusion

The conclusion should focus on what has been learned from the case report, should relate to the purpose of the paper and should not offer far-reaching, unsupported or general statements.^{8,15} The conclusion should not be a re-hash of the entire case. Conclusions should be about 1 paragraph in length.³

Acknowledgements

If appropriate, one may briefly acknowledge the work of a colleague who has assisted the author(s) in the preparation of the manuscript, but who does not meet the 3 criteria necessary to be named as an author. Such a person may be a proofreader, a research assistant, a medical writer, or a person who has provided ideas for the manuscript. Most journals require that people acknowledged must give written consent for their name to appear in print. For more information on the protocol for writing acknowledgements, writers should read the journal's instructions for authors and the *Uniform Requirements*.

References

References should be drawn primarily from peer-reviewed journal articles. Authors should use the most recent references possible, unless the history of scholarship in a topic area is being discussed. It is acceptable to use relevant references from books for information that is unlikely to change substantially over time; yet, journal articles provide current infor-

mation. Magazines and newspapers should not be used as sources of evidence for a peer-reviewed clinical manuscript, except under highly unusual situations.

References should be adequate to demonstrate that the author has surveyed the appropriate literature to provide appropriate substantiation for factual claims and should be selected for their relevance and quality.¹⁶ There is no recommended number of references because this depends on the content of the case report. However, some journals impose limits on the number of references allowed for case reports.^{2,3} A single authoritative reference for a factual statement may be adequate. A lengthy list of references published for the sake of documenting laborious scholarship may demonstrate a lack of understanding of the publication process and indiscrimination.¹⁶ References should be formatted appropriately, as described in the journal's instructions for authors or in the *Uniform Requirements*.

Tables

Clinical outcomes or sets of information that aid in visually presenting information in an appealing manner (rather than listing information as text in a paragraph) are tables.¹⁶ Tables should not be used for small amounts of data that could be conveyed clearly and succinctly in a sentence. Authors should not reiterate in sentences the data shown in a table, as the point of creating a table is to eliminate that type of sentence from the text.⁵⁵ A further caveat of tables is that horizontal rows and vertical columns of information are related to one another.⁵⁶ Therefore, a laundry list of differential diagnoses for a given condition, for example, is a figure, and not a table. Tables should be simple and self-contained,¹⁶ needing no further explanation. If authors wish to use previously published tables, the publishing company of the original material must grant permission to do so and it is the authors' responsibility to receive this permission before submitting the manuscript to a journal. Some journals limit case reports to a finite number of tables.¹⁴ Authors should consult the journal instructions for authors and the *Uniform Requirements* for further guidance.

Figures

Figures, graphs, photographs, or illustrations can make articles interesting to read and help greatly to describe clinical procedures or findings. Like tables, figures should be self-contained and fully interpret-

able on their own accord. Captions for each figure used in the manuscript should be provided; authors should not expect that journal staff will write the figure captions. When reporting figures, do not include identical information in a table.⁵⁵ If authors wish to use previously published photographs or illustrations, permission must be granted by the publishing company of the material and it is the author's responsibility to receive this permission before submitting a manuscript to a journal. If models or identifiable people appear in figures, the author should submit a signed release form for each person photographed, each person giving permission for their likeness to be published in the journal.

Journals change their requirements for figures with advances in technology. Authors should check the instructions for authors of the journal to determine what form of media is preferred by the journal staff. Similar to tables, the number of figures or illustrations may be restricted by journals.¹⁴ As mentioned before, authors should consult the journal's instructions for authors and the *Uniform Requirements* before submitting a manuscript.

CONCLUSIONS

Case reports are the first line of evidence in documenting clinical phenomena in the peer-reviewed literature. Proper preparation of a case report is essential in order for it to be published. A pre-submission self-evaluation check sheet derived from this review of the literature is appended to this article (Appendix A) in an effort to assist aspiring authors.

REFERENCES

1. Janicek M. Clinical case reporting in evidence-based medicine. Oxford: Butterworth-Heinemann; 1999.
2. Fenton JE, Khoo SG, Ahmed I, Ullah I, Shaikh M. Tackling the case report. *Auris Nasus Larynx* 2004;31:205-7.
3. Cohen H. How to write a patient case report. *Am J Health Syst Pharm* 2006;63:1888-92.
4. McCarthy LH, Reilly KE. How to write a case report. *Fam Med* 2000;32:190-5.
5. Iles RL, Piepho RW. Presenting and publishing case reports. *J Clin Pharmacol* 1996;36:573-9.
6. Chelvarajah R, Bycroft J. Writing and publishing case reports: the road to success. *Acta Neurochir (Wien)* 2004;146(3):313-6.
7. Pierson DJ. Case reports in respiratory care. *Respir Care* 2004;49:1186-94.
8. White A. Writing case reports: author guidelines for Acupuncture in Medicine. *Acupunct Med* 2004;22:83-6.
9. Vandenbroucke JP. Case reports in an evidence-based world. *J R Soc Med* 1999;92:159-62.
10. Martyn C. Case reports, case series and systematic reviews. *Q J Med* 2002;95:197-8.

11. Godlee F. Applying research evidence to individual patients. *BMJ* 1998;316:1621-2.
12. Procopio M. Publication of case reports. *Br J Psychiatry* 2005;187:91.
13. Moed HF, Van Leeuwen TN. Improving the accuracy of Institute for Scientific Information's journal impact factors. *J Am Soc Inf Sci* 1995;46:461-7.
14. Sorinola O, Olufwobi O, Coomarasamy A. Instructions to authors for case reporting are limited: a review of a core journal list. *BMC Med Educ* 2004;4:4.
15. Croll TP. Preparation of a dental case history report for publication. *J Am Dent Assoc* 1981;102: 59-61.
16. DeBaakey L, DeBaakey S. The case report. I. Guidelines for preparation. *Int J Cardiol* 1983;4(3):357-64.
17. Green BN, Johnson CD. Writing patient case reports for peer-reviewed journals: secrets of the trade. *J Sports Chiropr Rehabil* 2000;14:51-9.
18. Keating JC. Towards a philosophy of the science of chiropractic: a primer for clinicians. Stockton, CA: Stockton Foundation for Chiropractic Research; 1992. p. 199-222.
19. Walter G, Rey JM, Dekker F. The humble case report. *Aust N Z J Psychiatry* 2001;35:240-5.
20. American Medical Association. 51 landmark articles in medicine. Chicago: American Medical Association; 1985.
21. Doherty M. What value case reports? *Ann Rheum Dis* 1994;53:1-2.
22. Gehlbach SH. Interpreting the medical literature. New York: McGraw-Hill, Inc; 1993. p. 17.
23. Grimes DA, Schulz KF. Descriptive studies: what they can and cannot do. *Lancet* 2002;359:145-9.
24. Squires BP. Case reports: what editors want from authors and peer reviewers. *CMAJ* 1989;141:379-80.
25. Green BN, Johnson CD, Andrew T, Martin P. Improving historical research reports: a case report format and example in Arden Zimmerman, DC. *J Chiropr Humanit* 1998;8:43-54.
26. Kratochwill TR, Levin JR. Single-case research design and analysis: new directions for psychology and education. Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers; 1992. p. 1-14.
27. Keating JC, Giljum K, Menke M, Lonczak RS, Meeker WC. Toward an experimental chiropractic: time series designs. *J Manipulative Physiol Ther* 1985;8:229-38.
28. Polgar S, Thomas SA. Introduction to research in the health sciences. Melbourne: Churchill Livingstone; 1995. p. 99-105.
29. Waalen JK. Single subject research designs. *J Can Chiropr Assoc* 1991; 35:95-7.
30. Riddoch J. Evaluation of practice. *Physiotherapy* 1991;77:439-44.
31. Helawa A, Walker JM. Critical evaluation of research in physical rehabilitation: towards evidence-based practice. Philadelphia: W.B. Saunders Co; 2000. p. 28.
32. Bayoumi AM, Kopplin PA. The storied case report. *CMAJ* 2004;171: 728.
33. Green BN, Johnson CD. Writing better case reports. *J Sports Chiropr Rehabil* 2000;14:46-7.
34. Brodell RT. Do more than discuss that unusual case: write it up. *Postgrad Med* 2000;108. Available from: http://www.postgradmed.com/issues/2000/08_00/editorial.htm
35. Plaisance L. The 'write' way to get published in a professional journal. *Pain Manag Nurs* 2003;4:165-70.
36. Dixon N. Writing for publication: a guide for new authors. *Int J Qual Health Care* 2001;13:417-21.
37. Johnson CD. Questioning the importance of authorship. *J Manipulative Physiol Ther* 2005;28:149-50.
38. Har-El G. Does it take a village to write a case report? *Otolaryngol Head Neck Surg* 1999;120:787-8.
39. International Committee of Medical Journal Editors (ICMJE). Uniform requirements for manuscripts submitted to biomedical journals: writing and editing for biomedical publication. Philadelphia: ICMJE; [updated 2006 Feb; cited 2006 Oct 1]. Available from: <http://www.ICMJE.org>
40. Health Insurance Portability and Accountability Act of 1996. Pub. L. 104-191, 110 Stat. 1936 (1996).
41. Kljakovic M. Single cases in general practice and general medical journals. *Aust Fam Physician* 2002;31:669-73.
42. Green BN. Ensuring the privacy of protected health information in research. *J Manipulative Physiol Ther* 2005;28:461-2.
43. Reed ME. The HIPAA Privacy Rule: what it means for submissions to the journal. *Plast Reconstr Surg* 2003;111:1751-2.
44. Schachat AP. What is HIPAA and what effect may it have on our journal? *Ophthalmology* 2003;110:1074-5.
45. Levine SB, Stagno SJ. Informed consent for case reports: the ethical dilemma of right to privacy versus pedagogical freedom. *J Psychother Pract Res* 2001;10:193-01.
46. Bevan JC, Hardy JF. Permission to publish case reports/case series. *Can J Anesth* 2004;51:861-6.
47. Singer PA. Consent to the publication of patient information. *BMJ* 2004;329:566-8.
48. HIPAA and case reports—need some help [homepage on the Internet]. Ontario: World Association of Medical Editors; c2004 [cited 2006 Oct 1]. Available from <http://www.wame.org/hipaa.htm#>
49. Nakayama T, Hirai N, Yamazaki S, Naito M. Adoption of structured abstracts by general medical journals and format for a structured abstract. *J Med Libr Assoc* 2005;93:237-42.
50. Lawrence DJ. Structured abstracts and the JMPT. *J Manipulative Physiol Ther* 1992;15(2):77-82.
51. Lawrence DJ, Mootz RD. Research Agenda Conference 3: editor's presentation: streamlining manuscript submission to scientific journals. *J Neuromusculosket Syst* 1998;6:161-7.
52. Price DD, Bush FM, Long S, Harkins SW. A comparison of pain measurement characteristics of mechanical visual analogue and simple numerical rating scales. *Pain* 1994;56:217-26.
53. Vernon H, Mior S. The neck disability index: a study of reliability and validity. *J Manipulative Physiol Ther* 1991;14:409-15.
54. Wright SM, Kouroukis C. Capturing zebras: what to do with a reportable case. *CMAJ* 2000;163:429-31.
55. Durbin CG. Effective use of tables and figures in abstracts, presentations, and papers. *Respir Care* 2004;49:1233-7.
56. Anon. Interpretation of diagnostic data: 3. How to do it with a simple table (part B). *CMAJ* 1983;129:705-10.

APPENDIX A. CASE REPORT CHECK SHEET

THIS CHECK SHEET IS FOR AUTHORS TO USE AS A FORM OF SELF-EVALUATION PRIOR TO SUBMITTING A MANUSCRIPT TO A JOURNAL TO DETERMINE IF FURTHER WORK IS NECESSARY BEFORE SUBMISSION.

SECTION	DESCRIPTION	PRESENT
AUTHORSHIP	ALL AUTHORS MEET THE ICMJE CRITERIA FOR AUTHORSHIP	
	AUTHORS ARE LISTED IN THE ORDER OF CONTRIBUTION TO THE PAPER	
	A REASONABLE NUMBER OF AUTHORS ARE LISTED	
PATIENT PRIVACY	ALL IDENTIFYING INFORMATION HAS BEEN REMOVED FROM CASE REPORT MATERIALS	
	CONSENT FROM THE PATIENT TO PUBLISH THE CASE AND/OR APPROVAL FROM A PRIVACY OFFICER/IRB HAS BEEN OBTAINED	
TITLE	THE TITLE IS AN ACCURATE, SUCCINCT DESCRIPTION OF THE CASE	
ABSTRACT	THE ABSTRACT IS ≤250 WORDS IN LENGTH	
	THE ABSTRACT IS WRITTEN IN A STRUCTURED FORMAT	
	THE OBJECTIVE/PURPOSE IS CLEARLY STATED	
	THE MOST IMPORTANT PARTS OF PATIENT MANAGEMENT ARE HIGHLIGHTED IN THE CASE REPORT (METHODS) SUBSECTION	
	KEY OUTCOMES ARE PRESENTED IN THE RESULTS SUBSECTION	
	THE DISCUSSION SUMMARIZES WHAT THE CASE CONTRIBUTES TO THE LITERATURE AND STATES THE OVERALL CONCLUSION LEARNED FROM THE STUDY	
	KEY INDEXING TERMS FROM PUBMED MEDICAL SUBHEADINGS ARE PROVIDED	
INTRODUCTION	THE PURPOSE IS CLEARLY STATED	
	THE HEALTH PROBLEM AND ITS SIGNIFICANCE IS CLEARLY STATED (EG, PREVALENCE, INCIDENCE, MORBIDITY, FINANCIAL AND SOCIAL COSTS)	
	DEFINITIONS FOR PERTINENT TERMS OR CONCEPTS ARE PROVIDED	
	LITERATURE ON THIS PROBLEM WAS REVIEWED IN RELATION TO DIAGNOSIS AND TREATMENT	
	THE IMPORTANCE OF THE STUDY OR HOW IT CONTRIBUTES TO THE LITERATURE IS RELATED	
CASE REPORT	THE CASE IS DESCRIBED IN A CONCISE AND CLEAR MANNER	
	THE CASE IS PRESENTED IN CHRONOLOGICAL ORDER	
	PERTINENT PATIENT CHARACTERISTICS ARE DESCRIBED	
	SALIENT ASPECTS OF THE PATIENT'S HEALTH HISTORY ARE CLEARLY DESCRIBED	
	POSITIVE RESULTS AND SIGNIFICANT NEGATIVE RESULTS PERTINENT TO THE EXAMINATION ARE CONCISELY PRESENTED	
	APPROPRIATE OUTCOME MEASURES WERE UTILIZED FOR CLINICAL MEASUREMENT	
	NOVEL DIAGNOSTIC OR ASSESSMENT STRATEGIES ARE FULLY DESCRIBED	
	REFERENCES TO SUPPORT THE VALIDITY/RELIABILITY OF NOVEL DIAGNOSTIC TESTS ARE PRESENT	
	ALL UNUSUAL TERMS AND PATIENT VARIABLES ARE OPERATIONALLY DEFINED?	
	A DIAGNOSIS IS PRESENTED	
	TREATMENT PROCEDURES ARE CLEARLY AND CONCISELY PRESENTED	
	IMPORTANT OUTCOME MEASURES HAVE CORRESPONDING DATA REPORTED BEFORE/AFTER CARE	
DISCUSSION	THE CASE IS COMPARED TO WHAT IS KNOWN IN THE LITERATURE	
	DIFFERENTIAL DIAGNOSES ARE DISCUSSED	
	A RATIONALE FOR THE MANAGEMENT OF THE PATIENT IS PROVIDED	
	INTERPRETATIONS OF THE RESULTS ARE OFFERED BY THE AUTHOR(S)	
	THE AUTHOR(S) PROPOSES A MECHANISM FOR THE OBSERVED CHANGES	
	LIMITATIONS OF THE STUDY ARE OFFERED	
	SUGGESTIONS FOR FUTURE RESEARCH ARE MADE	
CONCLUSION	THE CONCLUSION RELATES TO THE PURPOSE OF THE PAPER	
	NEW INFORMATION LEARNED FROM THE CASE IS SUMMARIZED	
	THE CONCLUSION IS APPROXIMATELY 1 PARAGRAPH IN LENGTH	
ACKNOWLEDGEMENTS	WRITTEN CONSENT FROM THOSE ACKNOWLEDGED IS OBTAINED	
REFERENCES	THE AUTHOR(S) PROVIDES APPROPRIATE AND ADEQUATE REFERENCES	
	REFERENCES ARE PREPARED AS PER THE JOURNAL INSTRUCTIONS FOR AUTHORS	
TABLES	TABLES PRESENT DATA USING INTER-RELATING HORIZONTAL ROWS AND VERTICAL COLUMNS	
	TABLES HAVE A CORRESPONDING TITLE	
	TABLES ARE SELF-CONTAINED, NEEDING NO TEXT TO SUPPORT THEM	
FIGURES	PERMISSION TO REPRINT A PREVIOUSLY PUBLISHED TABLE IS OBTAINED FROM THE PUBLISHER	
	FIGURES ARE SELF-CONTAINED, NEEDING NO TEXT TO SUPPORT THEM	
	PERMISSION TO REPRINT A PREVIOUSLY PUBLISHED FIGURE IS OBTAINED FROM THE PUBLISHER	
	WRITTEN PERMISSION TO PUBLISH PHOTOS OF MODELS OR IDENTIFIABLE PEOPLE IS OBTAINED	
	FIGURES ARE PREPARED ACCORDING TO THE JOURNAL'S INSTRUCTIONS TO AUTHORS	
GENERAL	THE CASE IS OBJECTIVE AND DEVOID OF UNSUBSTANTIATED CLAIMS	
	THE CASE IS CLEARLY PRESENTED	
	THE CASE IS PREPARED IN ACCORDANCE WITH THE JOURNAL'S INSTRUCTIONS FOR AUTHORS	
	THE LENGTH OF THE CASE REPORT IS 1000-2500 WORDS OR LESS THAN THE MAXIMUM ALLOWED BY THE JOURNAL	