Writing Patient Case Reports for Peer-reviewed Journals: Secrets of the Trade

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ABSTRACT

objective: *To describe and discuss the process used to write a case report for publication in a peer-reviewed journal.*

methods: *Narrative review of the literature.*

discussion: *The importance for case reports is presented as well as the explanation of how to write them in a standardized format. Steps in preparing a case report are described and discussed starting with selecting a title and concluding with preparing appropriate illustrations.*

conclusion: *Case reports are important contributions to the health sciences literature. Proper preparation of this research design is necessary in order for it to be published in a credible manner.*

key words: *Case Report; Authorship; Peer Review, research; Manuscripts.*

INTRODUCTION

Background

Shunned by some, adored by others, the clinical case report is the foundational building block of scientific inquiry in health care (1). The case report is a specific type of research design that reports on an aspect of the management of one or two patients. Certain elements must be present in a case report in order for it to be publication worthy (2, 3). This article describes what is necessary in order to write a case report that is acceptable for publication in a peer-reviewed journal. This information will help new authors find the writing process easier and should assist previously published authors with some tips for writing their next case report.

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The chiropractic scientific community has reached a point of maturation where the case report is not regarded as simply anecdotal information. Thus, the significance of the case report to provide not only data but information about what occurs in clinical practice is being acknowledged and valued, especially since case reports are a foundation for experimental research. In addition to the scientific community's increased respect for case reports, these articles are interesting to journal readers since the information in case reports is practical and informative. Additionally, case reports are one of the best ways for authors to get started in scholarly writing (4).

Manuscripts received by journals are often returned to authors immediately because they are not formatted correctly or need further work to bring them in compliance with the acceptable standards for publication. Manuscripts that are ready for peer review, may require two or three passes through the peer review process before they are acceptable for publication. Most authors appreciate and utilize the extra input and suggestions they receive from the peer review process, however, others find this aggravating because it lengthens the time that it takes before their manuscript can be published. Many of these problems could be prevented if authors would prepare their manuscripts in the appropriate format for scientific publications.

Regardless of whether authors appreciate or disdain the peer

Table 1

Important principles to remember when preparing a manuscript

1. Format the manuscript according to the instructions for authors which can be found in each journal. Otherwise, editors will return it for correction without further review.

2. Scholarly, peer-reviewed journals rely on expert review to determine if the manuscript is of the quality to be published in the journal. A journal does not publish whatever material is sent to it. Therefore, authors should submit their best and final draft for peer-review. "Concerned writers want only their best efforts to be recorded for posterity." (2).

3. Rarely do seasoned authors have a manuscript accepted for publication upon the first submission. It is expected that some revisions will be necessary prior to acceptance, therefore patience and understanding are required.

4. Editors will do their best to provide resources, advice and encouragement for potential authors. However, authors are responsible for all of the writing and research.

Table 2

Reasons for submitting a case report for publication

1. To present an unusual or unknown disorder (1, 5).
2. To present unusual etiology for a case (1).
3. To present a challenging differential diagnosis (1).
4. To describe mistakes in diagnosis, their causes and consequences (1).
5. To describe an unusual setting for care (1).
6. To present information that can not be reproduced due to ethical reasons (1, 5).
7. To illustrate a clinical hypothesis (7).
8. To prompt a new hypothesis (3, 5, 7).
9. To disconfirm an hypothesis (9).
10. To support an hypothesis (3, 7).
11. To stimulate further research (7).
12. To make an original contribution to the literature (5, 10).
13. To offer new insight into the pathogenesis of disease (3, 4, 10).
14. To describe unusual or puzzling clinical features (3, 4).
15. To describe improved or unique technical procedures (2, 4).
16. To describe the historical development of a field or movement (11).

review process, there are a few important principles listed in table 1 that most journals hold to dearly. These should be kept in mind when submitting a manuscript.

Reasons for writing case report designs

Prior to spending large amounts of time and energy on large-scale experimental research, it is important to document evidence of cases and their occurrence (5). This can be accomplished by publishing case reports as the first line of evidence in clinical inquiry (1, 6). Case reports are also essential for communicating experiences encountered in clinical practice from one clinician to another (1-3, 5, 7).

Although some have regarded the case report design as trivial or anecdotal, there are many reasons why case reports provide value to our literature base (1, 7). 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 enough, five of these papers were case reports (8). In addition to contributing a first report of a clinical occurrence, case reports can be written for a variety of reasons, which are listed in table 2.

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. These limitations are inherent properties of the design itself and include the following: patients are managed in a non-controlled environment, case reports cannot be generalized beyond the context of the case to a larger population of patients, and the natural progression of disease or dysfunction may also explain results experienced in patient care.

First, the management of patients in an out-patient setting occurs primarily in an uncontrolled environment. There is little the clinician can do to prevent patients from introducing a variety of confounding factors into their lives that may also impact the patient's response to care. For example, chiropractors sometimes use repetitive active movements into end range, such as in McKenzie assessment, as a diagnostic procedure to assess if pain moves in a peripheral manner with activity. If the chiropractor later administers a chiropractic adjustment to the patient, it is impossible to state whether the adjustment or the repetitive motion may have produced an effect on the patient condition. Likewise, 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 are limited in their generalizability beyond the context of the patient reported (5, 12). 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 (9). One can hypothesize this, but it can only be tested using experimental clinical trials. However, authors of case reports may be encouraged to know that design of more elaborate experimental trials may be based on the very work 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 (12). Often times, one of these phases may correspond with the time when care is provided. For example, a patient with chronic adhesive capsulitis may present to the office 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 a remission state or the condition improved because of the care rendered. Similarly, if the patient presents 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 disease process at work. Therefore the natural history must be kept in mind when managing patients and writing a case report.

PRESENTATION STYLES OF CASE REPORTS

The styles of case reports described below help authors present their information to the reader. Case reports may be reported in a several manners including educational reports, diagnostic or assessment reports, and treatment or management reports.

Educational case reports

Educational case reports are used to provide readers with up to date patient management strategies while providing a brief review of the literature. This style may not add anything new to the general base of scientific information, but provides an interesting form of continuing education and illustrates a sense of the typical manifestation of a disorder so that atypical presentations can be compared to it (3, 7).

Diagnostic/Assessment case reports

This style of case report describes and discusses the diagnostic or analytic methods used to evaluate a patient. These cases present a diagnosis that is difficult to render, rare, or confusing. This form of case report presentation focuses on how the patient was assessed and may report any follow up used in the case, but does not discuss treatment rendered to the patient (7, 13).

For example, Young describes a patient who presented with a history of recurrent headaches. She was diagnosed with a pituitary adenoma after magnetic resonance imaging was obtained. The case report described the diagnostic process, presented pre and post-surgical images of the tumor site, and discussed the condition (14). Since there was no chiropractic management used in this case, treatment could not be discussed.

Treatment/Management case reports

This case report presentation style describes and discusses the full management of a patient. How the patient is assessed and managed, including reporting the results of valid outcome measures (7, 13), provides the reader with an in-depth understanding of the case.

THREE VARIETIES OF CASE REPORTS

Based on the rigor of methods employed, there are three primary varieties of case reports from which to choose, namely retrospective case reports, prospective case reports, and time series designs.

Retrospective case reports

The retrospective design is the most commonly reported in the literature (7). This variety is written after care for the patient has been delivered, thus no previous research was prepared prior to administering care. This type of report is the simplest to write for publication and is an excellent design for the beginning writer to use. In essence, if a clinician utilizes valid and reliable outcome measures in daily practice, has a specific management plan, writes clear chart notes, and can write a report for an insurance company, then much of what is needed to complete a retrospective case report has been already accomplished. Often times one of the faults of retrospective case reports is that authors do the best job possible while managing a case, but may not use the best outcome measures available because they do not know what they are. This fault detracts from the credibility of the report and is something that can be avoided with some early planning (7).

Prospective case reports

Prospective case reports differ from retrospective case reports in that the author actually plans out patient care ahead of time. For example, a chiropractor may frequently

see a number of patients with adhesive capsulitis of the glenohumeral joint. In preparation for a case report, this doctor reviews the literature to determine the best outcome measures to assess patient progress and also learns how his or her planned case will contribute to the literature. Published treatment protocols are also discovered 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 some work is required prior to actually seeing the case. However, it actually saves an inordinate amount of time in the writing of the manuscript because the literature has been reviewed ahead of time and the author will have used the most clinically appropriate outcome measures. An added bonus for the doctor is that the early planning and preparation for this case report improves the patient management in practice.

Time series case reports

In this design, a clinical hypothesis is generated by the doctor, tested over time, and documented with valid outcome measures (9). Time series designs are also prospective and patient data is recorded at specified intervals before during and after care is delivered (15, 16). Each part of the study is broken down into phases (12). A minimum of three measurements are taken on the patient's condition during each phase of the study thereby decreasing the likelihood that an inaccurate measurement is taken. Taking a series of three 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 (7, 17).

The most simple time series design is the "AB case report", where a minimum of three measurements are taken before care (A phase) and a minimum of three measurements are taken during care (B phase) (7, 12). More measurements can be taken and will provide more data for the clinician to use in analyzing the case (15). A variety of time series designs exist, which can easily be used in private practice. This is only a cursory introduction to time series designs. Prior to attempting to conduct this variety of case report, authors should become more familiar with this design by reviewing a variety of references that more fully discuss this design (e.g. 7, 13, 15).

WRITING THE CASE REPORT, STEP BY STEP

General guidelines

A successful clinical case report should present information that is written using the required elements for a case report, should be well structured and convey a clear message (1-3, 5). An objective and scientific approach on behalf of the author should be conveyed (2, 3) and conform to the formatting guidelines described in 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, as objective as possible, and can be processed by editors in an expeditious manner, thus providing the author with a better chance of earlier acceptance. The Uniform Requirements can be found on the Internet at http://www.icmje.org/index.html.

Uniform Requirements for Manuscripts: http://www.icmje.org/index.html

The presentation of a case report should be objective. It is essential that prospective authors remember that the intention of a case report is to describe and discuss a clinical event, not to prove anything (7). Keeping in mind the major limitations of the case report design, one should avoid writing a case report that tries to prove causation. The care rendered should not be overgeneralized and suggest that the care would be effective for any other patient than the one described. The necessary elements of a case report are similar to those required in all forms of scholarly articles (Table 3). A detailed checksheet for evaluating case reports has also been published (18).

Table 3

Case report components listed in order of appearance in the manuscript.

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

Table 4

Four elements for the informative case report title

Element	Example
1. Intervention is named.	Cervical adjustments
2. Outcome of the intervention is identified.	Changes in monofilament and nerve conduction velocity tests
3. Population under study is identified.	Professional cyclist
4. The condition of interest is stated.	Handle bar palsy

Title

The title of a case report should be an accurate, succinct description of the patient under study (2, 3). Janicek suggests that four items be included in the "informative title" in order for the reader to discern immediately what the paper is about (1). These items and examples are listed in table 4. The resultant combination of these elements could therefore be the following title 'Changes in Nerve Conduction Velocity and Monofilament Tests after Cervical Adjustments in a Professional Cyclist with Handle Bar Palsy'.

Writers should not use titles that suggest a large-scale trial was conducted because they are misleading to the reader. For example, 'The Effect of Cervical Adjustments on Nerve Conduction Velocity and Monofilament Tests in Handle Bar Palsy' presents the case as if more than one patient were studied in a clinical trial for effectiveness. Clever or artistic titles should not be used unless they are a subtitle because it is confusing and makes it difficult to determine the focus of the paper.

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. In addition, the information in the abstract and the title are entered into computer databases and indexing systems, and are thus essential for those conducting literature searches. A well written abstract allows people searching the literature to find the information in their search and discern whether or not they should retrieve the paper (1).

Abstracts should be written in a structured format (19). Structured abstracts are required in order to assure that all necessary information for an abstract is reported for the reader. 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 ten years ago (19). Subsections for case report abstracts consist of the following, which are also described in table 5: objective, clinical features, intervention and outcome, conclusion, key words (20).

Introduction

The purpose of the paper should be clearly described in the introduction (3, 10). In addition, background information needs to be provided in order to demonstrate how the case contributes to the literature. Information from a review of the literature allows the author to demonstrate that he or she understands the context of this case in relation to previously published data (2, 3, 10). 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 to not delve too deeply in to the subject (20). Therefore, it is essential that the author's preparation for writing the case report should include a comprehensive review of the literature (3), but it is important to limit the amount of information in the introduction only to what is adequate to familiarize readers with the topic. Authors can search the literature online using MEDLINE for information that is predominantly medical in nature (http://www.nlm.nih.gov/databases/freemedl.html) and MANTIS (http://www.healthindex.com) for chiropractic and other natural health methods.

MEDLINE database:
http://www.nlm.nih.gov/databases/freemedl.html
MANTIS database:
http://www.healthindex.com

Table 5

Standard subsections of the case report structured abstract.

Subsection	Description
Objective	• Clearly state the purpose of the paper.
Clinical features	• 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.
Intervention and outcome:	• Briefly describe methods used to care for the patient and/or assess the patient's status. • Briefly summarize outcomes of care, including changes in the primary outcome measures.
Conclusion	• 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). • List additional words that may be unique to the case or to the profession.

The author should also define unusual terms or words that are essential to understanding information in the paper. For instance, if a case of phantom limb pain in a disabled athlete is presented, it would be necessary to briefly define phantom limb pain and describe the athletic activity in which the disabled patient participates.

Medical Subheadings: http://www.ncbi.nlm.nih.gov/entrez/query.fegi

Case report (Methods)

The part of the paper that describes the patient, outcome measures, assessment protocols, and treatment, if applicable, is called 'case report'. While this may seem confusing because the research design being used is called the same thing, 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 fairly detailed description of the case and management for a number of reasons.

First, the reader should be provided sufficient information to understand the author's patient assessment. Second, since other clinicians will read the paper, it is important to describe procedures in a clear manner so that other doctors will be able to use the same protocol (20). Also, if future research will be based on this case report, researchers will need to have accurate descriptions from which to work. When chiropractic adjustments are given to a patient, the frequency and type of adjustments should be described in enough detail that the reader could reproduce them. For example, the following statement clearly describes what occurred, "*The patient was adjusted once a day for five days using a diversified chiropractic technique modified rotary break for a right rotation and right rotation restriction of the C7/T1 motion unit.*" In contrast, the following is vague and not reproducible, "*The patient was managed with chiropractic care.*" Photographs or illustrations of diagnostic procedures, radiographs, chiropractic adjustments, stretches or rehabilitation techniques are essential in conveying a clear message to readers and should be used when appropriate.

An extremely important part of the case report section is the reporting of patient data. Primary outcome measures should be used that quantify the patient's problem. Quality sources of data such as the visual analog pain scale (21), neck disability index (22), vital signs 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 (3).

In the case report section, just report the facts. This section should report the outcomes of the management as measured by the primary outcome measures and other data. It should be concise and should 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, tables that demonstrate before and after care measurements may help the reader understand the outcome. Pictures of post-intervention range of motion, posture, swelling or other key figures may also be helpful in relaying information to the reader.

Discussion

The explanation and discussion of the case belongs in the discussion section. If it has not already been presented in the introduction, an overview of how the condition is typically managed provides readers with information to compare the case report methods with. Since most case reports describe new things, it is essential to tell the reading audience what typically occurs in practice. Some authors give a brief report of the history of the condition which helps the reader understand the disorder and how it is managed. A discussion of differential diagnoses and how they were eliminated or included in the final assessment of the patient establishes that the author fully understands the problem and provided an adequate evaluation. A rationale for the management of the patient should be provided (2). If a previously published protocol was used to see if it would have an effect on the patient, this alone is adequate. However, if there are other reasons for selecting one procedure over another the rationale should be presented.

Writers should provide some suggestions or hypotheses regarding the outcome of the case and why the care provided may or may not have been beneficial (10). Support from referenced materials is helpful in this area and should be included. 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 (3, 10).

In addition, faults in the case or quality of reporting should be identified. For example, if the same person did not conduct orthopedic tests throughout care, the results could be quite different. Or, perhaps a better outcome measure could have been used to track the patient's condition, which is something that would be revealed as the author reads the literature on the topic. The discussion is the part of the case report where the author gets to provide his or her opinion, thus opinions should not appear elsewhere in the paper (20).

A final element for the discussion is some suggestion for future inquiry into the topic (3). Stating that "more research is needed" is inadequate (10). 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. For example, "*This case demonstrates that patients with iliotibial band syndrome may benefit from chiropractic adjustments of the tibiofibular joint. Future research in the form of more case reports, case series or small-scale clinical trials could add evidence to the literature about this phenomenon*."

Conclusion

The conclusion should not be a summary of the entire case. The conclusion should focus on what is to be learned from the case report. The conclusion should relate to the purpose of the paper and should not offer far-reaching, unsupported and general statements (2), due to the inherent limitations of the case report research design. A good example is this excerpt from the conclusion of a case report about managing a patient suffering from long-standing post-fracture movement disabilities (23). "*No firm conclusion can be reached from the results of a single case study, although it does suggest that chiropractic care may provide benefits for a patient with chronic stiffness and weakness arising from a Colle's fracture. This conservative approach should be considered before invasive procedures are pursued in patients with post-Colle's fracture complications*."

Acknowledgements

It may be appropriate to acknowledge the work of a colleague who has assisted the author in the preparation of the manuscript, such as a proofreader or a person who has provided ideas for the manuscript. These people can be acknowledged briefly in this section. People mentioned in this section must give consent for their name to appear in print, which can be obtained by asking them to sign a brief statement that they know that their name will be listed in the acknowledgements section of the article (20). For more information on the protocol for writing acknowledgements, see the Uniform Requirements.

References

Certainly references should primarily be drawn 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 some references

from books for information that is unlikely to change substantially over time; yet, journal articles provide information that is up to date. 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 literature to provide appropriate substantiation for factual claims and should be selected for their relevance and quality (3). Janicek suggests that references should be used to support information pertaining to the disorder under study, the clinical actions taken, and the decisions to be considered after reading the case report (1). There is no recommended number of references because this depends on the content of the case report. 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 (3). When providing references for theoretical information, such as is often found in the discussion, it may be necessary to provide a few references for a statement.

References should be formatted appropriately. Instructions for how to write out the references appropriately for a given journal are usually found in the journal's instructions for authors or in the Uniform Requirements. Proper formatting of references is essential, as it costs time and money on behalf of journal staff members to send this information back to authors for correction (24). All the information needed to correctly list a reference can usually be found with the abstract when conducting a literature search, or on the pages of the actual journal article.

Tables

Tables are lists of information, such as clinical outcomes, that aid in visually presenting information in an appealing manner rather than listing information as text in a paragraph (3). Tables should be simple and self-contained (3), needing no further explanation. If authors wish to use previously published tables, the publishing company of the original material must grant permission and it is the authors' responsibility to receive this permission. Appropriate formatting for tables can be found in the Uniform Requirements.

Figures

Figures or illustrations are a necessity to make articles interesting to read and help greatly to describe clinical procedures or findings. 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. Complete requirements for preparing illustrations or photographs for submission are detailed in the Uniform Requirements. Captions for each figure used in the manuscript should be provided. Authors should not expect that editors will write the figure captions.

CONCLUSION

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 in a credible manner. Appropriate presentation and formatting of case reports help readers understand and use the information and also helps authors have a positive experience with the peer review and publication process.

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