

### Guidelines to the writing of case studies

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#### Introduction

Case studies are an invaluable record of the clinical practices of a profession. While case studies cannot provide specific guidance for the management of successive patients, they are a record of clinical interactions which help us to frame questions for more rigorously designed clinical studies. Case studies also provide valuable teach-

ing material, demonstrating both classical and unusual presentations which may confront the practitioner. Quite obviously, since the overwhelming majority of clinical interactions occur in the field, not in teaching or research facilities, it falls to the field practitioner to record and pass on their experiences. However, field practitioners generally are not well-practised in writing for publication, and so may hesitate to embark on the task of carrying a case study to publication. These guidelines are intended to assist the relatively novice writer – practitioner or student – in efficiently navigating the relatively easy course to publication of a quality case study. Guidelines are not intended to be proscriptive, and so throughout this document we advise what authors “may” or “should” do, rather than what they “must” do. Authors may decide that the particular circumstances of their case study justify digression from our recommendations.

Additional and useful resources for chiropractic case studies include:

- 1 Waalen JK. Single subject research designs. *J Can Chiropr Assoc* 1991; 35(2):95–97.
- 2 Gleberzon BJ. A peer-reviewer’s plea. *J Can Chiropr Assoc* 2006; 50(2):107.
- 3 Merritt L. Case reports: an important contribution to chiropractic literature. *J Can Chiropr Assoc* 2007; 51(2):72–74.

Portions of these guidelines were derived from Budgell B. *Writing a biomedical research paper*. Tokyo: Springer Japan KK, 2008.

#### General Instructions

This set of guidelines provides both instructions and a template for the writing of case reports for publication. You might want to skip forward and take a quick look at

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the template now, as we will be using it as the basis for your own case study later on. While the guidelines and template contain much detail, your finished case study should be only 500 to 1,500 words in length. Therefore, you will need to write efficiently and avoid unnecessarily flowery language.

These guidelines for the writing of case studies are designed to be consistent with the “Uniform Requirements for Manuscripts Submitted to Biomedical Journals” referenced elsewhere in the JCCA instructions to authors.

After this brief introduction, the guidelines below will follow the headings of our template. Hence, it is possible to work section by section through the template to quickly produce a first draft of your study. To begin with, however, you must have a clear sense of the value of the study which you wish to describe. Therefore, before beginning to write the study itself, you should gather all of the materials relevant to the case – clinical notes, lab reports, x-rays etc. – and form a clear picture of the story that you wish to share with your profession. At the most superficial level, you may want to ask yourself “What is interesting about this case?” Keep your answer in mind as you write, because sometimes we become lost in our writing and forget the message that we want to convey.

Another important general rule for writing case studies is to stick to the facts. A case study should be a fairly modest description of what actually happened. Speculation about underlying mechanisms of the disease process or treatment should be restrained. Field practitioners and students are seldom well-prepared to discuss physiology or pathology. This is best left to experts in those fields. The thing of greatest value that you can provide to your colleagues is an honest record of clinical events.

Finally, remember that a case study is primarily a chronicle of a patient’s progress, not a story about chiropractic. Editorial or promotional remarks do not belong in a case study, no matter how great our enthusiasm. It is best to simply tell the story and let the outcome speak for itself. With these points in mind, let’s begin the process of writing the case study:

1. Title page:

- a) Title: The title page will contain the full title of the article. Remember that many people may find our article by searching on the internet. They may have to decide, just by looking at the title, whether

or not they want to access the full article. A title which is vague or non-specific may not attract their attention. Thus, our title should contain the phrase “case study,” “case report” or “case series” as is appropriate to the contents. The two most common formats of titles are nominal and compound. A nominal title is a single phrase, for example “A case study of hypertension which responded to spinal manipulation.” A compound title consists of two phrases in succession, for example “Response of hypertension to spinal manipulation: a case study.” Keep in mind that titles of articles in leading journals average between 8 and 9 words in length.

- b) Other contents for the title page should be as in the general JCCA instructions to authors. Remember that for a case study, we would not expect to have more than one or two authors. In order to be listed as an author, a person must have an intellectual stake in the writing – at the very least they must be able to explain and even defend the article. Someone who has only provided technical assistance, as valuable as that may be, may be acknowledged at the end of the article, but would not be listed as an author. Contact information – either home or institutional – should be provided for each author along with the authors’ academic qualifications. If there is more than one author, one author must be identified as the corresponding author – the person whom people should contact if they have questions or comments about the study.
  - c) Key words: Provide key words under which the article will be listed. These are the words which would be used when searching for the article using a search engine such as Medline. When practical, we should choose key words from a standard list of keywords, such as MeSH (Medical subject headings). A copy of MeSH is available in most libraries. If we can’t access a copy and we want to make sure that our keywords are included in the MeSH library, we can visit this address:  
<http://www.ncbi.nlm.nih.gov/80/entrez/meshbrowser.cgi>
2. Abstract: Abstracts generally follow one of two styles, narrative or structured.
- A narrative abstract consists of a short version of

the whole paper. There are no headings within the narrative abstract. The author simply tries to summarize the paper into a story which flows logically.

A structured abstract uses subheadings. Structured abstracts are becoming more popular for basic scientific and clinical studies, since they standardize the abstract and ensure that certain information is included. This is very useful for readers who search for articles on the internet. Often the abstract is displayed by a search engine, and on the basis of the abstract the reader will decide whether or not to download the full article (which may require payment of a fee). With a structured abstract, the reader is more likely to be given the information which they need to decide whether to go on to the full article, and so this style is encouraged. The JCCA recommends the use of structured abstracts for case studies.

Since they are summaries, both narrative and structured abstracts are easier to write once we have finished the rest of the article. We include a template for a structured abstract and encourage authors to make use of it. Our sub-headings will be:

- a) Introduction: This consists of one or two sentences to describe the context of the case and summarize the entire article.
  - b) Case presentation: Several sentences describe the history and results of any examinations performed. The working diagnosis and management of the case are described.
  - c) Management and Outcome: Simply describe the course of the patient's complaint. Where possible, make reference to any outcome measures which you used to objectively demonstrate how the patient's condition evolved through the course of management.
  - d) Discussion: Synthesize the foregoing subsections and explain both correlations and apparent inconsistencies. If appropriate to the case, within one or two sentences describe the lessons to be learned.
3. Introduction: At the beginning of these guidelines we suggested that we need to have a clear idea of what is particularly interesting about the case we want to describe. The introduction is where we convey this to the reader. It is useful to begin by placing the study in a historical or social context. If similar cases have been reported previously, we describe them briefly. If

there is something especially challenging about the diagnosis or management of the condition that we are describing, now is our chance to bring that out. Each time we refer to a previous study, we cite the reference (usually at the end of the sentence). Our introduction doesn't need to be more than a few paragraphs long, and our objective is to have the reader understand clearly, but in a general sense, why it is useful for them to be reading about this case.

4. Case presentation: This is the part of the paper in which we introduce the raw data. First, we describe the complaint that brought the patient to us. It is often useful to use the patient's own words. Next, we introduce the important information that we obtained from our history-taking. We don't need to include every detail – just the information that helped us to settle on our diagnosis. Also, we should try to present patient information in a narrative form – full sentences which efficiently summarize the results of our questioning. In our own practice, the history usually leads to a differential diagnosis – a short list of the most likely diseases or disorders underlying the patient's symptoms. We may or may not choose to include this list at the end of this section of the case presentation.

The next step is to describe the results of our clinical examination. Again, we should write in an efficient narrative style, restricting ourselves to the relevant information. It is not necessary to include every detail in our clinical notes.

If we are using a named orthopedic or neurological test, it is best to both name and describe the test (since some people may know the test by a different name). Also, we should describe the actual results, since not all readers will have the same understanding of what constitutes a "positive" or "negative" result.

X-rays or other images are only helpful if they are clear enough to be easily reproduced and if they are accompanied by a legend. Be sure that any information that might identify a patient is removed before the image is submitted.

At this point, or at the beginning of the next section, we will want to present our working diagnosis or clinical impression of the patient.

5. Management and Outcome: In this section, we

should clearly describe the plan for care, as well as the care which was actually provided, and the outcome.

It is useful for the reader to know how long the patient was under care and how many times they were treated. Additionally, we should be as specific as possible in describing the treatment that we used. It does not help the reader to simply say that the patient received “chiropractic care.” Exactly what treatment did we use? If we used spinal manipulation, it is best to name the technique, if a common name exists, and also to describe the manipulation. Remember that our case study may be read by people who are not familiar with spinal manipulation, and, even within chiropractic circles, nomenclature for technique is not well standardized.

We may want to include the patient’s own reports of improvement or worsening. However, whenever possible we should try to use a well-validated method of measuring their improvement. For case studies, it may be possible to use data from visual analogue scales (VAS) for pain, or a journal of medication usage.

It is useful to include in this section an indication of how and why treatment finished. Did we decide to terminate care, and if so, why? Did the patient withdraw from care or did we refer them to another practitioner?

6. Discussion: In this section we may want to identify any questions that the case raises. It is not our duty to provide a complete physiological explanation for everything that we observed. This is usually impossible. Nor should we feel obligated to list or generate all of the possible hypotheses that might explain the course of the patient’s condition. If there is a well established item of physiology or pathology which illuminates the case, we certainly include it, but remember that we are writing what is primarily a clinical chronicle, not a basic scientific paper. Finally, we summarize the lessons learned from this case.

7. Acknowledgments: If someone provided assistance with the preparation of the case study, we thank them briefly. It is neither necessary nor conventional to thank the patient (although we appreciate what they have taught us). It would generally be regarded as excessive and inappropriate to thank others, such as teachers or colleagues who did not directly participate in preparation of the paper.

8. References: References should be listed as described elsewhere in the instructions to authors. Only use references that you have read and understood, and actually used to support the case study. Do not use more than approximately 15 references without some clear justification. Try to avoid using textbooks as references, since it is assumed that most readers would already have this information. Also, do not refer to personal communication, since readers have no way of checking this information.

A popular search engine for English-language references is Medline:

<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi>

9. Legends: If we used any tables, figures or photographs, they should be accompanied by a succinct explanation. A good rule for graphs is that they should contain sufficient information to be generally decipherable without reference to a legend.

10. Tables, figures and photographs should be included at the end of the manuscript.

11. Permissions: If any tables, figures or photographs, or substantial quotations, have been borrowed from other publications, we must include a letter of permission from the publisher. Also, if we use any photographs which might identify a patient, we will need their written permission.

In addition, patient consent to publish the case report is also required.

## Template

Title:

Running Header:

Authors:

- a) Name, academic degrees and affiliation
- b) Name, academic degrees and affiliation
- c) ...

Name, address and telephone number of corresponding author

Disclaimers

Statement that patient consent was obtained

Sources of financial support, if any

Key words: (limit of five)

Abstract: (maximum of 150 words)

- Introduction
- Case Presentation
- Management and Outcome
- Discussion

Introduction:

Provide a context for the case and describe any similar cases previously reported.

Case Presentation:

- a) Introductory sentence: e.g. This 25 year old female office worker presented for the treatment of recurrent headaches.
- b) Describe the essential nature of the complaint, including location, intensity and associated symptoms: e.g. Her headaches are primarily in the suboccipital region, bilaterally but worse on the right. Sometimes there is radiation towards the right temple. She describes the pain as having an intensity of up to 5 out of ten, accompanied by a feeling of tension in the back of the head. When the pain is particularly bad, she feels that her vision is blurred.
- c) Further development of history including details of time and circumstances of onset, and the evolution of the complaint: e.g. This problem began to develop

three years ago when she commenced work as a data entry clerk. Her headaches have increased in frequency in the past year, now occurring three to four days per week.

- d) Describe relieving and aggravating factors, including responses to other treatment: e.g. The pain seems to be worse towards the end of the work day and is aggravated by stress. Aspirin provides some relieve. She has not sought any other treatment.
- e) Include other health history, if relevant: e.g. Otherwise the patient reports that she is in good health.
- f) Include family history, if relevant: e.g. There is no family history of headaches.
- g) Summarize the results of examination, which might include general observation and postural analysis, orthopedic exam, neurological exam and chiropractic examination (static and motion palpation): e.g. Examination revealed an otherwise fit-looking young woman with slight anterior carriage of the head. Cervical active ranges of motion were full and painless except for some slight restriction of left lateral bending and rotation of the head to the left. These motions were accompanied by discomfort in the right side of the neck. Cervical compression of the neck in the neutral position did not create discomfort. However, compression of the neck in right rotation and extension produced some right suboccipital pain. Cranial nerve examination was normal. Upper limb motor, sensory and reflex functions were normal. With the patient in the supine position, static palpation revealed tender trigger points bilaterally in the cervical musculature and right trapezius. Motion palpation revealed restrictions of right and left rotation in the upper cervical spine, and restriction of left lateral bending in the mid to lower cervical spine. Blood pressure was 110/70. Houle's test (holding the neck in extension and rotation for 30 seconds) did not produce nystagmus or dizziness. There were no carotid bruits.
- h) The patient was diagnosed with cervicogenic headache due to chronic postural strain.

Management and Outcome:

- a) Describe as specifically as possible the treatment provided, including the nature of the treatment, and the frequency and duration of care: e.g. The patient undertook a course of treatment consisting of cervical and

upper thoracic spinal manipulation three times per week for two weeks. Manipulation was accompanied by trigger point therapy to the paraspinal muscles and stretching of the upper trapezius. Additionally, advice was provided concerning maintenance of proper posture at work. The patient was also instructed in the use of a cervical pillow.

- b) If possible, refer to objective measures of the patient's progress: e.g. The patient maintained a headache diary indicating that she had two headaches during the first week of care, and one headache the following week. Furthermore the intensity of her headaches declined throughout the course of treatment.
- c) Describe the resolution of care: e.g. Based on the patient's reported progress during the first two weeks of care, she received an additional two treatments in each of the subsequent two weeks. During the last week of care she experienced no headaches and reported feeling generally more energetic than before commencing care. Following a total of four weeks of care (10 treatments) she was discharged.

Discussion:

Synthesize foregoing sections: e.g. The distinction between migraine and cervicogenic headache is not always clear. However, this case demonstrates several features ...

Summarize the case and any lessons learned: e.g. This case demonstrates a classical presentation of cervicogenic headache which resolved quickly with a course of spinal manipulation, supportive soft-tissue therapy and postural advice.

References: (using Vancouver style) e.g.

- 1 Terret AGJ. Vertebrogenic hearing deficit, the spine and spinal manipulation therapy: a search to validate the DD Palmer/Harvey Lillard experience. *Chiropr J Aust* 2002; 32:14–26.

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Legends: (tables, figures or images are numbered according to the order in which they appear in the text.) e.g.

Figure 1: Intensity of headaches as recorded on a visual analogue scale (vertical axis) versus time (horizontal axis) during the four weeks that the patient was under care. Treatment was given on days 1, 3, 5, 8, 10, 12, 15, 18, 22 and 25. Headache frequency and intensity is seen to fall over time.

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