

COMMENTARY

THE JOURNAL ARTICLE COOKBOOK

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INTRODUCTION

Collectively, we, the authors of this article, have delivered over 100 poster or platform presentations, published over 50 journal articles (in 8 different journals), published over 2 dozen textbook chapters, and have edited 2 textbooks currently in use. And yet, neither of the authors holds a degree in education, research, or language arts. We have not been hired as full-time scholars, and we have other responsibilities in our lives, such as our spouses and children, academic duties, and private practices. Despite these challenges and limited formal training, by combining a process of trial and error, by consulting and mimicking other more accomplished authors, by incorporating what we have learned at instructional seminars and perhaps by using some innate skills, the authors have managed to do what many, more qualified colleagues have not yet done: publish articles in peer-reviewed journals.

However, the purpose of this article is not to sing our own praises or to pat ourselves on the back. Rather, we have a much more humble goal in mind. We figure that, if we can get our works published, so can others. The problem is that many people in the chiropractic profession who are endowed with considerable research skills or a wealth of clinical experience or who just have something interesting to say, may not know how to go about accomplishing an intimidating task, namely, the researching, writing, and editing of a manuscript so that it survives the peer-review process and is judged suitable for publication in a reputable journal. Because we believe the future triumphs of the profession will depend on the ongoing accrual and dissemination of scientific knowledge originating from within the chiropractic community, it is our intent to provide the reader with a step-by-step strategy to overcome many of the hurdles facing a novice author. Once described, perhaps the intimidating veneer of this process will be removed. For the sake of simplicity and because the metaphor is not altogether inaccurate, we

have likened the process by which a journal article is developed to cooking. However, before beginning the discussion, the reader must pause to answer 1 important question...Why publish?

Why, indeed! The process of starting with a blank screen and ending up with a quality manuscript is an arduous task. It is time consuming, it is frustrating, there is usually no monetary compensation, some in the field will take great pleasure in scoffing at your conclusions, and still others will simply ignore your hard effort as generally unimportant. Both what you have written and how you have written it will come under scrutiny by, at times, hostile and unnecessarily cynical critics. While writing an article, both of us have had our computers unexpectedly freeze, thus losing hours of work product. Both of us have had data saved on computer discs that inexplicably did not open or that caused other computers to crash, and we both have suffered the indignity of having our computer inform us we have "performed an illegal operation." Both of us have been delayed by coauthors (sometimes a necessary evil) who have not contributed to an article, as they committed to do. More to the point, the reader should not expect to be able to simply write a scholarly article in 1 sitting. An article worthy of publication can, at times, take months to create. So, before even putting pen to paper (or finger to keypad), the reader should examine their motivation behind his or her desire to have an article published.

Within academic circles, there is considerable pressure put on teaching faculty to publish. Many colleges (and other academic institutions) link salaries, promotions, and traveling privileges to an individual's scholarly accomplishments. Thus, for those readers involved in teaching at a chiropractic college, there are practical reasons to have an article published. Most academic institutions will gladly pay for your traveling expenses if the abstract of your article is accepted for publication (see *What to Do With Your Article While It's in the Oven*, below), and some conferences may actively seek you out (and pay you handsomely) if you can establish yourself as a content expert in a particular area of study. You can establish yourself as an expert in a particular area of study in many different ways. These include synthesizing the current literature or theories and then publishing in scientific journals. You can also participate in scholarly endeavors or

you may choose to publish a case study about your clinical experiences in a peer-reviewed journal.

However, for individuals outside of the college environment, the motivation to publish may be more simplistic, but no less important. Many private practitioners may have a wealth of clinical experience that they wish to share with the profession at large. Perhaps the practitioner has been able to successfully manage a particular condition by using a certain therapeutic approach. A practitioner may have found that spinal manipulative therapy benefited a patient with cervicogenic headaches¹ or used ischemic compression for fibromyalgia,² or perhaps the clinician has had a uniquely interesting case study or case series he or she may wish to describe; for example, improvement in behavior of children with autism by using upper cervical chiropractic care³ or a resolution of a case of psoriasis while under network spinal analysis care.⁴ Perhaps the reader wishes to add his or her opinion about a controversial topic of the day or topics that spawn divisive positions within the profession. Recent articles have covered topics such as, Is chiropractic a primary care profession or portal of entry?⁵ Does the concept of innate intelligence have a place in modern chiropractic?⁶ Are there examples of bias and ignorance with respect to chiropractic in medical reporting?⁷ What are the statistical risks of stroke associated with cervical spine adjustment?⁸ Is there a way to make sense out of the different ways chiropractors use the word *subluxation*?⁹ And, where is the chiropractic profession today in terms of its' position in the health care delivery system?¹⁰

In any event, the altruistic reason of "wanting to give something back" to the profession at large is not a trivial consideration. We applaud those practitioners, researchers, and educators who wish to try to add to the knowledge base of the profession, regardless of the underlying reason to do so.

PICKING THE RECIPE

First, the reader should begin by picking a topic to write about. The topic can be broad, but the article must be focused. For example, although both of us have published several articles in the area of geriatric care, we have focused each article on a particular topic, such as trauma,¹¹ ageism,¹² chiropractic education,^{13,14} and osteoarthritis and osteoporosis management.¹⁵ There is no conceivable way to write 1 article completely encompassing a particular area of interest; it may be more appropriate to focus on a particular element within that topic. In that way, a person will not bite off more than he or she can chew and become frustrated by the enormity of the task at hand.

Consider the following analogy: One of us is an avid comic book collector (yes, the guy). Comic books and their predecessors ("the funny papers" and pulps) have been around for about 100 years, and comic books can be

divided into different eras of publication (golden age, silver age, modern age, and so on) and by genre (super hero, sci-fi, horror, romance, etc.). There have been hundreds of thousands of different issues published by dozens of different publishing companies, using hundreds of different artists and writers. Given the enormous variety and number of different comics that are potentially collectible plus the relative rarity and cost of some issues, it would be impossible to collect every comic book ever published. Instead, as with most collecting hobbies, a comic book collector focuses on only 1 area of the hobby and, by staying focused, is able to accumulate the issues he or she desires most.

In much the same manner, the reader must realize that any 1 article can only accomplish specific goals and thus considerable thought should be given to the exact message or information that the writer wishes to convey. Moreover, the would-be author should not feel obliged to write about a topic he or she thinks is currently in vogue or that he or she thinks would appeal to a wider audience, especially if that author has very little interest in that topic. In essence, just as with comic book collecting, an author should always stick to what he or she knows and stick to what he or she likes. If your interest lies in the treatment of dysmenorrhea, write about dysmenorrhea.¹⁶ Do not worry if your area of interest seems to be at the periphery of the profession. Odds are, if you find a particular topic interesting, so will others. In addition, if you choose a topic you find interesting, it is more likely that your enthusiasm will emerge from your writing style (see Use of Spices, below). Conversely, if you try to write an article on a topic that you find rather dull, the article will probably reflect your lack of passion and come out as bland and ultimately uninteresting to read.

There are also other practical reasons for deciding *what* you're going to write about first. Your choice of topic will drive your choice of journal. Have you conducted a study involving patients in a clinical setting or gathered data and performed statistical analysis of that data? If so, the *Journal of Manipulative and Physiological Therapeutics (JMPT)* may be the best place to submit your article. Have you written an article on a particular topic, perhaps synthesizing other articles into a certain theme? If so, then *Clinical Chiropractic* may be a more appropriate journal selection. A well-documented case study may find a home in the *Journal of the Canadian Chiropractic Association (JCCA)* or the *Chiropractic Journal of Australia*, and an article describing a feature of chiropractic education can logically be submitted to the *Journal of Chiropractic Education*. There are journals devoted to issues surrounding the care of children (*Journal of Clinic Chiropractic Pediatric*) and of older persons (*Journal of the American Geriatric Society*); there are even journals devoted to specific topics, such as chiropractic history (*Chiropractic History*). Currently, there are 14 different chiropractic scholarly journals from which to choose, give or take a few.¹⁷

If you have conducted a more complex experimental study (based on data derived from a laboratory setting), then *Spine* or *Clinical Biomechanics* may be more suitable for your article. You need not limit your target to only journals with a chiropractic slant. Some chiropractors have successfully published articles in *The Archives of Internal Medicine*, *Pain*, *The American Journal of Public Health*, *The New England Journal of Medicine*, and *The British Medical Journal*.¹⁷

Choosing the journal you wish to target for potential publication is important for several reasons. Each journal has its own preferred editorial (writing) style, and some journals are less tolerant of any deviation from a standard format. Also, each journal has its own preference for referencing style (see Recipe Writing [So Others Can Cook As Well As You], below). Therefore, one method to avoid unnecessary obstacles along the path toward publication is to review a similar article in the journal to which you plan on submitting. The more your article conforms to the format of other articles in that journal, the more likely it is your article will be accepted for publication.

CHOOSING THE CHEFS

Some people work better on their own, whereas others work better in large groups. Each approach has advantages and disadvantages. If you decide to tackle an article on your own, although there is more work for you to do, you get to decide what information will be in it, and of course, you alone get all the credit for it. In essence, you maintain exclusive “creative rights” on your project. However, because most of us are not learned in many different areas, seeking the help of others can prove useful. In writing this article, for example, either of us could have written it alone and probably could have done a good job, but we thought by combining our experience, knowledge, and talents, we could produce a better all-around product.

If you decide to work with others, you must choose people who are reliable, people who don't just talk the talk but can walk the walk (that is, will do what they say they will do), and, just as importantly, people who can work well together. We know of several high-quality articles that were delayed for years because of disputes between coauthors, and nothing will slow you down more than a coauthor who does meet the responsibilities to which they committed. If this happens, you may have to make the tough decision of removing an author from the project (one of us had to do just that to complete a textbook chapter).

Allying yourself with other authors has other benefits, as well. By involving different people in the project, you can draw on the unique skill-set each individual possesses. For example, perhaps your skills lie in the collection of data from a clinical trial, but you feel you lack strong writing or organizational skills. Other partners in your article may,

therefore, be called on to assemble your clinical findings into a comprehensible manuscript. You can join with a senior content expert, someone who is a seasoned veteran in the publication world. That person can become an important mentor for you, offering you steady guidance in the academic world, a place where, at times, even brave people dare not tread (or at least tread lightly). At some point, however, it will have to be made clear who is to be main chef and who are the cooks and bottle-washers, and each author's duties will have to be delegated accordingly. Otherwise, as the old adage goes, “too many chefs can spoil the broth. . .”

SHOPPING FOR INGREDIENTS

By ingredients, we mean the content of the article. First, write a draft of your entire article, start to finish, bearing in mind the general structure required by your targeted journal. For example, most data studies are divided into the following sections: Introduction, Methods (Study Design), Results, Discussions, and Conclusions. However, some articles, such as commentaries or case studies, may be written with alternate structures, so check a representative article first.

After you write your first draft, or even before, you explore what has previously been written on this topic by others to better strengthen your article or to prepare an explanation as to why you may have observed (or believe) something different than others before you. In other words, you must conduct a thorough literature search.

But how? There are hundreds of journals and tens of thousands of articles, not counting books, information from websites, and expert opinions. How can 1 individual, especially someone not computer savvy, access the key articles in any topic? The answer is simple: if you don't know how to do it, go to someone who does. In this case, the best person is a librarian at a chiropractic college resources center. Librarians know how to set up complex searches and how to do it quickly. We would also encourage our readers to ask the librarian to show you some appropriate search strategies. This will enable you to better scour the literature for the articles you need for your own publications and to enhance and better inform the decisions you make in clinical practice.

Using key words, the librarian is able to glean the different databases for the articles that are the most relevant to your topic. A database is best thought of as an electronic depository into which only certain journals are permitted to contribute. It is the mark of a prestigious journal to be permitted to contribute to a prestigious database. It is this distinction that separates indexed journals from nonindexed journals, and it also creates a hierarchy of peer-reviewed journal status.

The quality and quantity of articles found through literature searching depends on the skill of the searcher and the choice of key words used in the search. The librarian

will give you a package of abstracts (which are brief synopses of the articles) that contain the key words used in the search. You must then go through them one by one, weeding out those that are of no interest or do not relate to your topic and keeping those of value. For example, in one search of literature by using a key word with reference to a System Technique, we obtained abstracts on topics dealing with sexual orientation.

Because the literature search usually only provides an abstract of the article, it is necessary to obtain the parent article, especially if it appears to relate to your topic. This is important for several reasons. First, the authors of that article probably have conducted a literature search themselves, and you can identify important facts from the work of others. In fact, the more often an article is referred to in other articles, the more likely that that article is a key article on that topic and worth retrieving. Another reason for obtaining and reading an article in its entirety is that, more often than not, the body of the article contains information not found in the abstract. This is because some journals have very strict policies as to what information can or should be included within an abstract and what should not.

An example of this situation can be seen by comparing 2 recent articles, each monitoring the effects of spinal manipulative therapy (SMT) on patients with asthma. In one of these articles, Balon et al¹⁸ received much flack from some members of the chiropractic community because the abstract of that article stated that “in children with mild to moderate asthma, the addition of chiropractic spinal manipulation to usual medical care provided no benefit.”^{18(p1013)} (Author note: Always provide page numbers when referencing a direct quote.) However, in the manuscript of that article, the authors also described other secondary outcomes experienced by asthmatic patients under chiropractic care, including decreased need for medication, subjective improvement in quality of life scores, and high satisfaction with the care provided. In their defense, Balon et al¹⁸ had simply asked a particular question (Does spinal manipulation affect children with mild to moderate asthma?), they had chosen a particular outcome measure (peak forces expiratory flow as measured by spirometry), and they reported primarily on their findings related to that particular outcome measure. The authors strove to remain true to the parameters set by the particular journal in which their article was published (in this case, the *New England Journal of Medicine*).

However, another article recently published by Bronfort et al¹⁹ on the same basic topic in a different journal (*JMPT*) reported different results. This is because these researchers asked different specific questions (Did SMT in addition to optimal medical management result in clinically important changes in asthma-related outcomes in children?) and used different outcome measures (pulmonary function tests; patient and parent rated asthma-specific quality of life and

asthma severity improvement; morning and evening peak expiratory flow rates; and daily diary-based day and nighttime symptoms). In this study, the researchers reported that, after 3 months of SMT and optimal medical management, the children rated their quality of life substantially higher and their asthma severity substantially lower.¹⁹ In any event, a researcher can only learn of the underlying issues of these different studies by reading a manuscript in its entirety.

As an aside, the difference between these 2 studies shows an important component of journal article content and the development of *evidence-based practice*. Following the model described by Bolton,²⁰ both of these studies are important and comprise “evidence.” The difference is that the study by Balon et al¹⁸ is a randomized clinical trial, is more quantitative in nature, and exhibits greater internal validity, whereas the study by Bronfort et al,¹⁹ being practice-based and qualitative in nature, exhibits more external validity. In other words, the former study explored the effect of SMT on asthma patients under an ideal, controlled setting using a priori outcome measures, and the latter study explored the effect of SMT on asthma patients in the uncontrolled and complex “real world.” The importance of both types of research is becoming more and more recognized; so, if your article falls into either category, it stands a good chance of being well received by a journal editor.

WARNING: UNAUTHORIZED COOKING

We feel it is important to pause here and caution a novice researcher or author not to engage in experimental studies on their patients in a practice-based setting on their own. There are often very important ethical issues that must be considered, and these issues may not be readily apparent. It is for this reason that a clinical trial proposal (or any type of research that involves human participants) must pass through an Institutional Review Board (IRB) of an academic institution prior to beginning. Along with appropriately dealing with ethical issues, the panel of the IRB may provide suggestions that might improve a clinical trial’s methodology, data-collection strategies, and statistical analysis. Even seasoned researchers well acquainted with research methodologies are required to submit their proposals for review by an IRB. In other words, when learning how to cook, start with simple dishes and serve them to people you know well before trying to master the soufflé!

If retrieving a journal article by hand, make sure to photocopy the references as well. Again, they may prove to be a valuable source of information. More importantly, remember that any reference taken from the Internet must be used cautiously, because there are few safeguards guaranteeing the validity or authenticity of a reported fact, statistic, or

opinion. Statements supported by a website reference only are often of dubious value at best and must be taken with a grain of salt.

It is customary to write a journal article in the *third person passive*, meaning the writer should avoid phrases like “we did this or that” or “I found whatever.” (The reader may have noticed that we purposely decided to use a less formal writing style). Moreover, an article is usually, but not always, written in the past tense, and the writer should take care not to mix up present, past, and future tenses in the same article, lest it become too confusing.

When referring to the work of others, it is an easy trap to overstate someone else’s finding, especially if it should happen to support the point you’re trying to make. This pitfall must be avoided. For example, virtually any study, regardless of how well it is designed, cannot “prove” anything. That is to say, even the best-designed randomized control studies do not prove, for example, that manipulation cures patients of their acute low back; rather these studies “show” or “demonstrate” or “report” that this may be the case *in that study*. Also, it is important to accurately repeat the language used in a study when referring to it. For example, the Quebec Task Study on Whiplash-Associated Disorders²¹ concluded that there was “weak cumulative evidence” for the use of spinal manipulation for neck pain and recommended that a short regimen of SMT may be used as a therapeutic trial; it did not “strongly endorse” it. Thus, when referring to the Quebec Task Force Study, the specific recommendations made by them should be reiterated verbatim.

Assuming a causative link between chiropractic care and apparent “results” in an observational study is another pitfall into which an inexperienced author can easily fall. For example, in 2 separate articles, Rupert et al²² and Coulter et al²³ reported that older patients under chiropractic maintenance care were more likely to be active in their community, less likely to use prescription medications, more likely to report better health status, and less likely to require nursing care facilities. An impassioned reader may assume a cause-and-effect relationship between these findings and chiropractic maintenance care. However, it is more accurate to state that these results must be interpreted cautiously, because it is possible that older persons who seek out chiropractic care may possess these healthier attributes to begin with. Both Rupert et al²² and Coulter et al²³ made this distinction in their articles, points that would be missed by reading the abstracts alone or not reading them carefully. On the one hand, if you were to draw a reader’s attention to the fact that a causal relationship between chiropractic care and an older person’s health status cannot necessarily be made, your thoughtful interpretation will gain the respect of your potential audience. On the other hand, if you neglect to mention this caveat, it may only serve to diminish the integrity of all the other statements you make in your article.

USE OF SPICES

In cooking, a dish too bland or too spicy may be unpalatable. Similarly, a journal article can make effective use of various literary devices if used, or not used, appropriately and in moderation. For example, the use of direct quotations, rhetorical questions, slang, humor, analogies, contractions (you’re, don’t, ain’t), catch phrases, and even the use of other languages at times (Latin, French, Yiddish), can all be powerful literary tools and may make an article more interesting to read. The key, just as with spices, is not to overdo it.

Complex sentences and obscure words should be avoided if they are only being used to sound fancy and mysterious. Consider the books written by John Grisham. A lawyer by trade, Grisham has written 10 consecutive bestsellers over the past decade, many of which have been adapted into movies. A close inspection of this writing style shows that Grisham often uses short, simple sentence structure and avoids “legalese” wherever possible, thus appealing to a wide audience.

Technical jargon known to only a very few experts in any field may only serve to have a reader skip over your article without reading it, because no one wants to waste their time trying to read something they will not understand, and no one wants to think of themselves as “unschooled.” That said, a writer need not shun the use of a particular word or phrase if it has a specific, exact meaning, even if it is technical or obscure. For example, in a recent article on autism, one of us wrote:

“Although well-intentioned, many self-styled authorities, celebrated private practitioners and self-proclaimed *mavens* in this area, along with unsubstantiated rhetorical commentaries from professional organizations, often provide information that only serve to muddy the already murky waters.”^{24(p42)}

Maven is a Yiddish word referring to a person who is an expert in a certain field of study. However, in the context of this article, the word *maven* was used sarcastically and was meant to imply someone who claims to be an expert in a particular area but really isn’t. It’s someone who claims mastery or superiority in an area of study and, because they are misguided in this belief, often conveys inaccurate information. The use of the word *maven*, in this context, captured the exact sentiment the author was trying to convey.

COOKING FROM THE HEART

Another effective literary device is the use of one’s own personal experiences. In a recent article, one of us recounted that:

“I am 38 years old. Over the winter break, I broke my arm in a somewhat bizarre sledding accident involving a plastic sled and an unintentional flight over a large snow ramp. On

the same day, a 5-year-old boy I know sustained the same Colles fracture of the radius and ulna that I did.”^{11(p10)}

The author then proceeded to explain how the differences in their ages impacted each of their respective times of recovery after trauma and how this applies to the difference in healing times between older persons (seniors) and younger adults. In this case, delving into one’s own personal life experience can provide a useful connection with a reader. (It also helps to strengthen the argument as to why comic book collecting is preferable to snow sledding!)

In other cases, using words like *plethora* instead of *a lot* or *paucity* instead of *hardly any* and *germane* instead of *with specific reference to* are all useful terms, provided a writer uses them in moderation. Constantly using words that are obscure or not commonly in use can be distracting to a reader who may have to otherwise keep running to their dictionary. Thus, to write a high-quality article, you don’t need a thesaurus at your side. Or, simply put, it is sometimes best to put things simply. . .

RECIPE WRITING (SO OTHERS CAN COOK AS WELL AS YOU)

Basically, your article will consist of the data, facts, or opinions you have generated and the data, facts, and opinions of others unearthed by your literature search. The task now is, once all the ingredients are on the table and ready for mixing, how do you let others know what you added first and from where the ingredients came.

This process is analogous to the referencing process. Because each journal has its own preferred referencing style, it is advisable to review an article from the journal you intend on submitting your article to and to follow exactly the referencing style they use. It is important to understand that one referencing style is not necessarily better than another or that one is “right” and others are “wrong.” It is just that the editorial board of each journal has arbitrarily decided on the format each journal should follow; so, don’t argue.

Once your article is published, you certainly wouldn’t want someone else taking credit for your work or not giving you credit for a unique comment or finding you published. Similarly, any idea that is not your own and that came from another source should be identified as such. New writers are cautioned to use only the articles that pertain specifically to the point being made and to use the most up-to-date and highest quality references available. When in doubt as to whether or not to reference a statement made in your article, reference it. Information from book chapters and websites (always include the date the site was accessed) and even personal communications can also be references (just denote that the statement is a personal communication).

In general, there are 2 basic formats of referencing used for articles in the basic sciences. The first style (used in this article) is to simply sequentially number each referenced

statement in the order in which it appears in your manuscript. For example, the first statement attributable to someone else will be numbered as “1,” the next statement as “2,” and so on. In the reference section, you will then describe the source of each statement as it appears, beginning with the first author’s last name, then his or her initials, then other authors, then the title of the article, and finally the journal volume number it was published in, including the page numbers. The punctuation used varies slightly between journals, so be careful to follow it exactly. Reviewers and editors can become deeply annoyed with an author who does not follow the reference format. It is a tedious task to “fix” entire reference sections, so it is wise for an author to list their references correctly before submitting the article for review and publication.

The other style is a bit more complicated. Some journals want each author listed alphabetically in the reference section by the first author’s last name, and each reference is sequentially numbered. From there, each statement to be referenced in the manuscript is numbered according to the *number of the author*. For example, “Abbot, Joe” may be reference number 1 and “Smith, Jane” may be reference number 46. In the manuscript, however, if the first statement that needs referencing is by Smith, the first reference number to appear in the manuscript would be 46.

Referencing a statement made in another reference that you do not have in hand is a bit more of a gray area. In general, as long as the reader will be able to retrieve the article or book chapter you’re referring to for themselves and you haven’t taken credit for someone else’s work, then you’ve met your scholarly duties. It is still always best to obtain all the articles you refer to, to be sure that you are not misquoting or misinterpreting a fact or statement, and that the citation is accurate. It is a headache to find out that just as you are completing the final draft of your article (perhaps including a reviewer’s suggested revisions), one of the references you cited from another reference is not complete or accurate. Oftentimes, this requires that you rewrite a section of your manuscript or it may cost you some credibility with a journal or its readership.

Lastly, the more current the article you are referencing, the more likely it will include current studies and opinions about a certain topic and thus better strengthen your article overall. Moreover, the higher up on the hierarchical pyramid of evidence your reference is, the more support it may lend to the point you’re trying to make.

GUEST CHEFS

The authors would like to encourage new writers to acknowledge those who helped in the publication process. Perhaps someone put in numerous hours proofreading, offering input, formatting the text, or word processing for you. If someone contributed in a significant way to your

article, it is important to mention his or her contributions in the form of a written acknowledgment. Such a kind and appropriate gesture of mentioning someone's name in print is generally appreciated but requires that you get the individual's permission to mention his or her name in print.

A SAMPLE DISH: THE CASE STUDY

For the first-time author, the simplest article to write is probably a case study or perhaps a case series (essentially a collection of a number of case studies, each managing patients under the same clinical scenario). For this type of article, an author chronicles the events surrounding the care of a patient (or group of patients) (Table 1). Perhaps the patient presented with a unique chief complaint,²⁵ or something that is commonly seen,²⁶⁻²⁸ or something that is rarely seen,²⁹ or something that could have been misdiagnosed.³⁰ Alternatively, an author may wish to detail how a clinical condition has been successfully managed by practitioners.³¹⁻³⁵

In any event, a case study or case series usually begins with a brief discussion of the presenting chief complaint, providing such details as the disease prevalence, symptoms, and natural progression; how the condition is diagnosed; and perhaps a brief discussion of traditional medical management. Early on, the author should try and "hook" a reader into the manuscript. An author can persuade a reader to continue to read on by emphasizing the likelihood that a practitioner will encounter a patient with this problem "in the field." You can emphasize the possible tragic outcome if the condition is not identified or perhaps stress the impact of the disease in terms of economic, emotional, or social costs to the patient, the patient's family, and the health care delivery system.

After a brief discussion, the author should then provide pertinent details from the patient's history and physical examination that led the author to suspect that the patient was suffering from the diagnosis in question. Given the tremendous variability that exists in the chiropractic profession, it is informative to *specifically* list (and perhaps describe) what diagnostic tests were used (prone or supine leg check, posture, static and motion palpation, orthopedic maneuvers, heel tension, and so on). Visual aids are very attractive, so radiographs or other images (magnetic resonance imaging, computed tomography scans) can be included if they are available and if they contain information pertinent to developing the patient management plan. The diagnosis should be recorded and the management/care plan should be described.

The most useful case studies we have read specify *exactly* what therapeutic measures were initiated for the patient. For example, simply stating that "the patient was treated by spinal adjustments" is far too ambiguous for the chiropractic profession. Spinal adjustments can be inter-

Table 1. *The article chef's checklist for a well-prepared case study*

1. Did I cite 5 to 25 pertinent articles in my Introduction section?
2. Did I describe my examination/assessment of the patient clearly enough to rationalize my care plan?
3. Is my Method section detailed enough that a reader could duplicate my study? (Did I specifically explain the assessment/diagnostic and therapeutic/management strategies used?)
4. Is there a lengthy enough follow-up period in my study or should I follow-up the patient for a while longer before publishing?
5. Was I careful NOT to make statements about "proof," "effectiveness of care," and "cause and effect" in my study?
6. Was I careful NOT to generalize my Results or to extrapolate my results to other cases?
7. Did I list the limitations of my own study in my Discussion section?
8. Did I proofread my article for grammar, spelling, and clarity of thought?
9. Did I have a chiropractic colleague review my article?
10. Did I have a nonchiropractor read my article for clarity, use of jargon, etc?
11. Have I complied with the formatting requirements of the journal to which I am submitting my article?

preted to include spinal manipulation (high velocity, low amplitude [HVLA] thrusts), instrument adjusting (Activator, Phoenix, Az), blocking techniques (Sacro Occipital Technique [SOT]), and many others. Thus, if a patient with sacroiliac dysfunctions (subluxations?) was treated by using spinal manipulative therapy, this should be clearly stated. Better yet, an exact description of the type of spinal manipulative therapy should be described. For example, if this hypothetical patient with sacroiliac dysfunction was treated by using a side-lying SMT procedure, with the doctor contacting the patient's posterior superior iliac spine (PSIS) with his or her pisiform, then that is what should be described. In this manner, a reader will know exactly what procedure was performed. This may be particularly important if the reader wishes to emulate the plan of treatment used in the case study. As importantly, if the practitioner is using a technique with which the majority of readers are unfamiliar, it behooves the author to describe the technique used in detail. If the practitioner used ice, heat, electrical modalities, botanical medicines, acupuncture, recommended stretches, or ancillary supports (orthotics, cervical pillow), they should all be listed. Lastly, the frequency of interventions should be described. That is, how many times a week was the patient seen, what was done, and for how many weeks? In other words, there are no "secret family recipes" in case study reporting.

(Author's note: Given the divergent world views within chiropractic, it may be helpful to provide a working definition of what an author means when they use the word *subluxation*.⁹ For example, is the author referring to a joint dysfunction, reflexive model, tonal-based approach, or something else altogether? In any case, the terminology

used in an article should be clarified and defined to avoid any misunderstanding.)

The outcomes used to monitor the patient's response to care should be described. Common outcome measures include patient testimonials (ie, "I felt better" or "the pain went away"), questionnaires, improvements in symptoms, or positive changes in whatever diagnostic methods were used (ie, straight leg increasing from 30° to 90° or improvement in gait). Standard surveys appropriate for use in a variety of clinical scenarios are available, ranging from a 36-question general health assessment tool (the 36-item short-form [SF-36], RAND 36-Item Health Survey [RAND-36], etc.) to a simple Visual Analog Scale that can assess pain or just general well-being.

Once the specific details of the case have been described, it is customary to further describe the clinical condition under review in the Discussion section. This often includes a literature search on what has been published about this illness by others. Certainly, if other practitioners have described managing this chief complaint either the same way or by using a different method, then that should be discussed in detail. Again, how this condition is medically managed should be described, not so much from a misanthropic perspective but as a contrast to using a noninvasive, nonpharmacologic approach, such as chiropractic care.

Lastly, it is important to provide a Conclusion section to your article. Essentially, the Conclusion section reiterates the clinical presentation, how you identified and characterized it, how you cared for the patient and why, and the possible implications to the health professional or the health care system of your findings. However, be cautious not to imply your findings are necessarily earth-shattering; what you perceive to be a monumental finding, one that makes you yell "Bam!!" when you talk about it to someone else, may actually be perceived by others as little more than "rediscovering lukewarm water," as one of our in-laws is fond of saying.

THE ICING ON THE ENCHILADA

In case writing, as in cooking, there are some flavors that just don't match. As most chefs would balk at putting icing on an enchilada, the authors wish to point out some extremely unpalatable flavor combinations we have seen in our experience as reviewers and writers (yes, we too have been raked over the coals for our writing inadequacies!). To make this article more practical and useful, we will now provide some commonly made real-world examples of writing faux pas we have come across in our scholarly travels. To try and make this exercise even more instructive, we suggest that you read each sentence, pause to consider its strengths and weaknesses as if you were a peer reviewer, and try and think of suggestions that could "fix" any

problem you think needs fixing. We then offer our critique of the sentence for you to compare. It our hope that this exercise will provide a strong dose of preventative medicine so that you will not repeat the embarrassing mistakes of those who have written before you.

Example 1

"Adjustments of the atlas were given 3 times during the first week of care."

Strengths. The authors were very specific about how many times the patient was adjusted during the first week of care. Unfortunately, some authors often omit such important information.

Weaknesses. What's an atlas and how was it adjusted?

Improvements needed prior to submission for publication. It would not be clear to a nonchiropractor what action occurred. Was a road atlas repositioned on the patient's lap? The terms *atlas* and *axis*, although well known within the chiropractic milieu, may be foreign to nonchiropractors. Thus, the more generic *first cervical vertebral segment* may be clearer.

Now, what exactly was the adjustment? This can refer to any number of clinical interventions. Again, recall that one item in the Method section is the description of what was done to the patient in such a way that the reader could replicate the intervention if need be.

Suggested revision. "The patient received chiropractic adjustments (Upper Cervical Technique) to the first cervical vertebra or atlas on the first, third, and fifth days of this study. In particular, the author adjusted the patient by using the Toggle Recoil Technique. These adjustments were performed with the subject recumbent on his right side, on a Toggle Recoil table. The doctor's stance was always in front of and facing the subject, with the shoulders centered over the subject's involved spinal vertebra. The thrust was delivered through the pisiform of the doctor's left hand. The doctor delivered a quick, shallow thrust in the direction appropriate for the correction of the first cervical vertebra (atlas). The contact point was the patient's left transverse process of the atlas."³²

Elsewhere, the author would have explained what assessment methods were used to determine atlas subluxation (radiography, supine leg checks, thermographic pattern analysis, palpation, or a host of others). This level of specificity in describing what exactly was done to the patient can be rather painstaking. But, at the end of the day, it is clear to anyone reading this paragraph, be they chiropractic student or orthopedic surgeon, what patient management strategies were initiated to care for this patient.

Example 2

"The patient was adjusted 7 times over a 3-week period using the Activator."

Strengths. The author not only described how many times the patient was adjusted but also reported over what period of time these adjustments were delivered.

Weaknesses. Although the reader may know what an Activator is, it is unclear whether or not the author of this case study used the Activator in a generic manner (as a substitute for manual spinal manipulation) or if the author followed Activator Methods Chiropractic Technique (AMCT) protocols.

Revision. “The patient was adjusted 7 times over a 3-week period by using the Activator Methods Chiropractic Technique (AMCT) protocol as described by X (cite an Activator Methods manual or textbook).”

What we are driving at is that case studies can serve a vitally important role in the science of health care. Here’s how it works:

1. Someone does something new or observes an unexpected outcome or
 - 1a. Someone has managed something commonly seen by practitioners or
 - 1b. Someone avoided a potentially tragic event in their office through vigilant diagnostic skills
2. They write about it in scientific, professional journals
3. Colleagues read about it and do the same things in their clinical practice
4. Better outcomes are realized by more chiropractors
5. More chiropractors write about their results
6. Researchers design larger and better controlled studies to assess or monitor the purported effectiveness of this new strategy observed in private practices
7. Chiropractic practice can be improved
8. Patients are better served through improved chiropractic practice

SPOILAGE

Although case studies can significantly add to the science of chiropractic, they can also be used for nefarious purposes as well. That is, there are a few things that can spoil an otherwise well-described case study so fast that it will make your (or your reviewer’s) head spin. Some of these things are simple to fix, but some require serious revisions. Here are 2 glaring examples of spoiling a well-prepared dish.

(1) The thinly veiled sales pitch (or, the “order now and get a free set of knives” syndrome).

Occasionally, we read through a case study and by the end of it we are really excited about the miraculous things that happened to the patient. Then, as the article wraps up, it makes an unexpected turn toward the dark side. Before we know it, we are being told that if we want to get similar results with our patients experiencing the same problem, all we need do is order a special piece of equipment or attend a particular seminar for the low, low price of \$1,999.99!

There are few things that can permanently disturb a reviewer more than a good writer who tries to use her/his literary prowess to hawk a tool or gadget or technique for profit. It is inappropriate to use a case study for such purposes. Advertised gadgets belong in advertisement sections. They do not belong in scientific writings, pure and simple.

(2) The proof is in the pudding.

Although that may be true, the proof is not in the case study. As we mentioned earlier, no study, even the most rigorously designed controlled clinical trial, offers “proof” that a treatment, therapy, or care protocol is effective under any and all circumstances. A case study, although exceedingly important to the foundation of the evidence base pyramid, is not designed to ever show *effectiveness* of chiropractic care. The role of the case study is to *describe* the identification, management, or presentation of a condition of interest. At the end of the study, it is appropriate to only say what you saw and did and nothing more. Chiropractors learning the art of case study writing should repeatedly recite the following mantra:

“I will *never* write any phrase that resembles: This study shows that chiropractic is an effective treatment for anything!”

Sound harsh? Well, too bad! We absolutely have to avoid making such claims in case study writing. Cause and effect are reserved for experimental studies, such as clinical trials. Because most chiropractors will be writing observational papers, such as case studies, and small observational outcome studies, comments inferring cause and effect relationships should not be made.

THE FOOD CRITICS: READYING YOURSELF FOR THE REVIEWS

If the reader learns nothing else from this article, it will hopefully arm you with enough hints and tips that your anxiety about the peer review process should be allayed. The authors have both gone through the peer review process themselves and have acted as peer reviewers, so read carefully.

First, there is no faster way to aggravate a peer reviewer than to hand him or her a manuscript that is obviously *raw*, meaning that there are numerous grammatical errors, spelling mistakes, disjointed sentence structure, scattered content, and improperly placed and incorrectly cited references. We have both reviewed articles that are confusing and difficult to follow, with thoughts and concepts appearing as jolts throughout the manuscript.

To avoid unnecessarily aggravating your peer reviewer, it is always advisable to vet your manuscript through another person before submitting it to a journal. Odds are the other person will identify any basic errors in the manuscript, be they grammatical or factual. Because most of us type slower than we think, it is not uncommon for any

of us to write a paragraph that makes perfect sense to us but is virtually undecipherable to anyone else.

THE FUSSY EATER TEST (A.K.A. THE CYNICAL TEENAGE OR MOTHER-IN-LAW TEST)

It may be extremely valuable to first give your manuscript (when you think you are done writing it) to a fussy eater to read, particularly if they have better language skills than you. This temporarily painful strategy will help identify those areas of your paper that are simply unclear or confusing. It is amazing how many embarrassing errors this type of peer review can identify before submission to a professional journal. Secondly, the article should be given to a fellow chiropractor or scholar to review for scientific soundness and appropriate and clear use of professional language. For some chiropractors, particularly those publishing from a chiropractic educational institution, it is important to have a colleague review the article for the "political correctness" of the language. For example, some chiropractors take offense to either the use or the omission of words such as *subluxation*, *manipulation*, *treatment*, and *diagnosis*. Although the authors of this article do not lose much sleep over such semantics, we understand the deep-rooted emotions that some of these words carry with them in the profession. Thus, we often opt for the general health language, well understood both inside and outside the chiropractic profession. Examples include *care for* in lieu of *treat* and *assess* rather than *diagnose*. We agree to disagree at times over the word *spinal manipulation* versus *spinal adjustment* or *subluxation* versus *joint dysfunction*, perhaps in no small part because of our respective college upbringings (These differences notwithstanding, we are still able to share our toys and play together nicely. . .)

Once you submit your article to a journal, the procedure that follows is relatively simple. The editor of your chosen journal distributes copies of your manuscript to a group of content experts whom the editor feels can fairly appraise your article. Your name appears nowhere on the copy of the manuscript sent out for review (it is "blinded") and only the editor knows the identity of the individuals who are reviewing it. The list of reviewers can usually be found in the journal itself under Editorial Board, although additional reviewers are enlisted by journals at least occasionally.

The goal of the peer-review process is to ensure that your article meets the editorial standards set by the editor of that journal. Because the process is blinded, no personal vendettas or favoritism should come into play. So, as difficult as it may be to have your work critiqued, through the peer-review process, your article will be accepted or rejected based solely on its merits and strengths (or lack thereof). In our experience, there are usually 2 to 5 reviews sent back, and they come in 3 flavors: Good, Bad/Not-So-Bad, and Ugly.

The first flavor (the Good) is for the reviews that come back recommending your manuscript be published (usually at least 1 of the reviews is favorable, provided your article is pretty good to begin with). These reviews state that your article is well written, well referenced, thoughtful, and important to the profession. They have few, if any, editorial recommendations and think it is suitable for publication with only minor revision, usually suggested by the editor or reviewer.

The next flavor of reviews (the Bad or Not-So-Bad) is less flattering, but still recommend your manuscript for publication. These reviewers may have found some grammatical errors or some misinterpreted facts and may even provide you with some additional references or sources of information that should be included to strengthen your article. They may deem that these deficiencies are not important enough to block publishing your article in its current format or they may simply suggest the manuscript be resubmitted with the minor corrections.

The last review (the Ugly) is the one any author must steel himself or herself against. One of us has suggested that a good article writer needs a certain anatomic composite: a thoughtful mind to penetrate a topic's complexities and to ask tough questions, the limbs to collect the answers, the eyes to envision the possible impact the article may have on the profession, and so on. But most important of all, a writer needs a certain testicular fortitude (yes, even the women!) to withstand the dispersions cast by one's peers.

This group of peer reviewers wonders aloud what illegal substance you were using when you wrote your article. The reviewers report that your article is poorly written, poorly referenced, poorly illustrated, and of little, if any, scientific value. They wonder not only why you wasted your time writing this article but also why you wasted their time forcing them to read it. Truth be told, some valuable insights can be gathered from even these, the harshest of reviews. It depends, however, on the quality of the reviewer's refereed score sheet. That is, only those reviews that both indicate your article's shortcomings as well as provide insightful solutions are of greatest value.

If your article has survived the peer-review process, there is still 1 more problem awaiting you. Given the constant flow of new information, some of which could be added to your article, in addition to what could be good editorial recommendations from the peer reviewers, how do you know when your article is finished? At what point in time should you serve-up your article as a final draft ready for consumer consumption (publication)? Or, looked at another way, how do you know if your article is overcooked? Our general rule of thumb is this: when you can no longer look at the article, when the mere mention of it initiates your gag reflex, you know its time to call it a day. Submit the final version of your article, recognize that it can never capture all the information or ingenuity that you possess, wait for it to

be published, and hang up your apron for the day. It's "Miller Time!"

WHAT TO DO WITH YOUR ARTICLE WHILE IT'S IN THE OVEN

It may take 6 months to a year from the time you first submit your article for review until it is published, provided it does not require any major revisions. During this time, while your article is "baking," you can still put yourself and your article to good use. That is, until such time as it is in print, it is perfectly acceptable to send an abstract of your article to professional conferences for presentation. One well-known researcher compares this with slicing a loaf of bread. The more slices you make (that is, the more conferences you submit an abstract of your article to) the more people you can serve with the same loaf. Many seasoned writers are quite adept at this process and have been known to squeeze several conference trips out of 1 article while it is making its way through the publication process.

THE FINISHED PRODUCT

To this day, we find few things as gratifying as seeing our names appear in a journal article, knowing that we have in some small way contributed to the knowledge base of the profession at large. While some of your peers may enviously sneer at your accomplishments, most will tip their collective hats in your direction. However, there is also an odd mathematical axiom in the publication world: the extent to which your work is read is often in inverse proportion to the distance from the college in which you work. In other words, as one well-known biblical author opined, "You're never a prophet in your own land." At the very least, however, you can now proudly take your place among the ranks of the profession's scholars, even if you, like us, are closer to the back of the line than the front (see [Table 2](#)).

CONSUMER RESPONSE

The last step in this process is one for which you should be prepared. Even though you may have taken great care to prepare your manuscript and despite the fact that it has survived the peer-review process, the chiropractic community at large still may not warmly welcome it. Be prepared that there could be an irate reader who takes umbrage with what you have written and chooses to challenge your article in a Letter to the Editor. You are then obliged to explain why you did what you did (or did not do) or to defend any other statement you may have made in a To the Editor in Reply. But this is the academic process at work, so don't be intimidated or discouraged. Looked at from our culinary context, some people may stop to read the menu in front of

Table 2. *Recipe for success*

1. Keep it simple.
2. Proofread.
3. Mimic the format of a published article that you like.
4. Have a peer proofread the content and flow.
5. Have a nonchiropractor proofread for grammar and clarity.
6. Check your references.
7. Proofread once more for embarrassing things that the spellcheck won't catch (ready, sex, go?!).
8. Keep your fingers crossed.
9. Submit your article for publication.
10. Wait patiently for your reviewer comments.
11. Receive reviewer comments.
12. Scream, beat on pillows, curse like a sailor, suggest that reviewer was progeny of unnatural events, but do not burn your manuscript!
13. Cool down for a week or so (depending on the magnitude of the suggested revision).
14. Do your revisions (take heart, you're almost there).
15. Resubmit.
16. Get your gallery proofs.
17. READ them carefully to catch small errors.
18. Resubmit (there's no going back now).
19. You're done. Hurray!
20. Celebrate responsibly.
21. If you receive a Letter to the Editor challenging what you have written, repeat #12.
22. Cool down. Craft a careful response, always taking the high road in your response.
23. Vet your response through someone else not emotionally attached to the issue.
24. Reply to editor. Humbly apologize if you're wrong, stand your ground if you're right!
25. Repeat steps #1 through #24 on new topic.

your restaurant but may choose to eat at home. Alternatively, after noshing on some of your recipes, they may tell their friends to eat somewhere else.

FINAL THOUGHTS

It is our sincere hope that we have invested the reader with the confidence, directions, and tools on how to go about and what to expect from the creation of a peer-reviewed manuscript suitable for publication in a reputable journal. Perhaps today's the day you'll try and compose a manuscript on your own (*Carpe Diem!*). Or, in keeping with our cooking reference, it may be like when a grandmother places a plate of knishes in front of her grandson and says, "Go ahead, try it. You'll like it. . ."

AUTHORS' NOTE

The reader may have observed that the authors used many of the literary devices (spices) described throughout the body of this article, including direct quotations, slang, contractions, personal experiences, humor, inferred vulgarity, other languages, catch phrases, analogies, and rhetorical

phrases. Hopefully, they were used effectively to illustrate our points. The reader will have to be the judge.

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