Case Reports in Respiratory Care

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The information in a case report should be viewed cautiously in terms of generalization beyond the reported example. Appropriately written and interpreted, however, a case report can be a valuable contribution to medical knowledge and educational for both author and reader. This article discusses the essential components of a case report, important issues of patient confidentiality, and how authorship should be determined. It then describes 10 common pitfalls in case report writing. These are inexperience, insufficient documentation of the case, insufficient awareness of practice beyond one's own clinical setting, describing substandard care, illogical or unphysiologic intervention, poor focus of presentation and discussion, inappropriate manuscript format, poor writing, ineffective illustrations, and poor use of references. The article then presents 10 specific ways to avoid or deal with these pitfalls, with the aim of increasing the likelihood that a prospective author's manuscript

will be accepted for publication. These ways include seeking appropriate assistance with writing, documenting the case as thoroughly as possible, and carefully justifying any new technique or intervention. Authors are urged to expend the time and effort required to prepare the manuscript properly, using the journal's guidelines and paying special attention to illustrations and references, and also to have the manuscript read by a local colleague before formal submission. After submission, authors should view the receipt of reviewers' comments and subsequent manuscript revision as necessary and positive steps toward successful publication. *Key words: publishing, case reports, medical writing, research, medical education, patient confidentiality, authorship.* [Respir Care 2004;49(10):1186–1194. © 2004 Daedalus Enterprises]

Introduction

Reporting noteworthy individual cases is a time-honored practice in health care. Not all journals accept single case reports, but many do. In a recent review of over 10,000 publications in general practice and general medical journals, about 7% were reports of single cases.[1] Since its inception, RESPIRATORY CARE has published case reports as a useful mechanism for documenting unusual conditions, unexpected findings, and novel interventions, and also as a means for teaching and review. In this article, which updates an editorial[2] and follow-up report[3] published more than 20 years ago, I discuss the pros and cons of case reports, offer advice on deciding which cases are appropriate for publication, and provide practical guidelines for writing them. A number of similar, helpful guides from various other health care contexts have also been published, both before[4] and after[5–11] those original pieces in this Journal.

The Unimportance—and Importance —of Case Reports

The single case report occupies a pretty low rung on the ladder of evidence-based medicine, which today's students, investigators, and clinicians are admonished to climb diligently in their quest for scientific truth and rational clinical decision making. Available schemes for ranking the various levels of evidence place randomized controlled trials at the top—superseded only by meta-analyses of multiple randomized controlled trials—and retrospective studies, case series, and unsystematic observations at the bottom.[12] Most such hierarchies do not list case reports at all. Those that do, relegate them to the evidence ladder's lowest rungs along with anecdotal observation and expert opinion.

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Data from a single case, and any conclusions or speculation drawn from it, clearly do not have the weight of findings of the other types of research studies described in this issue, such as clinical trials,[13] retrospective studies,[14] and surveys.[15] Often the information in a case report was gathered retrospectively from what had been recorded in the patient's chart, and important or even vital information with respect to documenting the nature of the illness or occurrence may be missing. Initial reports of new phenomena or associations can prove misleading because of the selective inclusion of features or results, and case reports have been criticized for emphasizing the unique and bizarre[16] rather than common principles more likely to be helpful to others. Especially when the report focuses on responses to therapeutic intervention, without a comparison group or control situation any inferences as to causation are rightfully suspect.[17]

On the other hand, several authors have pointed out that, prepared carefully and interpreted with appropriate circumspection, case reports have a valuable part to play in both the advance of medical knowledge and the pursuit of education.[10,18–20] In a thoughtful defense of case reports and case series in the era of evidence-based medicine, Vandenbroucke[21] listed 5 roles of potential contribution for this type of publication:

- Recognition and description of a new disease
- Recognition of rare manifestations of a known disease
- Elucidation of the mechanisms of disease
- Detection of adverse or beneficial side effects of drugs (and other treatments)
- Medical education and audit

RESPIRATORY CARE recognizes 2 distinct roles for case reports: as sources of new knowledge and as important means for education and learning.

The Case Report As a Source of New Knowledge

From a global perspective, clinical presentations, diseases, complications, and responses to intervention that occur most

often are clearly more important than things that are rare or have apparently happened only once. Knowing the basics well and rendering state-of-the-art care in everyday "bread-and-butter" situations will benefit far more people than being aware of exotic things the individual clinician may never see. The other side of that coin, however, is that the clinician who does not know about the rare condition, the unusual manifestation, or the atypical response to therapy is likely to miss it, and in so doing to provide the affected patient with something less than the best possible care.

In the past, unusual phenomena published in individual case reports tended to disappear into the mass of medical literature and not to be widely known among practitioners and teachers. However, with today's electronic databases and powerful search engines, a published case is instantly available to millions of clinicians, researchers, and lay readers alike. This can be both good and bad. It is good if new observations are accurately recorded and described and if they are interpreted cautiously without hyperbole and unwarranted speculation. It is bad if the experience of a single case comes to influence clinical practice, education, or policy without appropriate verification and corroboration.

The observations recorded in case reports are most appropriately used for hypothesis-generation. In this vein, Khan et al[11] have written that case reports, "are not about establishing evidence—they are about implanting clinically useful reminders in clinician's [sic] heads and about generating research questions for which methodologically sound studies should be carried out."

Huth[22] lists 4 kinds of reportable cases under the heading of new knowledge: a unique case that may represent a previously unknown syndrome or disease; a case with the previously unreported association of 2 distinct diseases, suggesting the possibility of a relationship between them; an "outlier" with features strikingly outside the realm of what is usually seen with a particular disease; and, an unexpected response or course suggesting a previously unrecognized therapeutic or adverse effect of intervention. Added to this list for readers and potential authors of RESPIRATORY CARE, with examples the Journal has published in recent issues, might be:

- Documentation of a previously unreported finding in a rare condition that suggests a possible pathogenetic mechanism[23]
- Demonstration in a patient of a phenomenon or response to intervention that was previously documented only in animal models[24]
- Documentation of a new manifestation or finding, or clearer demonstration of a known feature of a disease, using a new technology or method[25]
- Demonstration, by means of modern technology, of known physiologic principles through the findings in a patient with a rare condition[26]
- Documentation of a clinically important hazard or potential problem associated with the use of a commercial device[27]

Perhaps the most important aspect of publishing a case report for the purpose of documenting new things and thus adding to existing knowledge is not to step beyond its limitations in interpreting the reported observations. Experience with a single case, or even a series of cases, should not change the way patients are managed. That is a job for higher levels of evidence. When effective, case reports expand our understanding and suggest possible future work without drawing inappropriate conclusions or extrapolating beyond the limited information they provide.

The Case Report As a Vehicle for Teaching and Learning

Unlike the situation in many fields, medicine is learned mainly in the workplace, in this instance through contact with patients. In the hands of a skilled instructor, the features demonstrated by an individual patient can teach others a great deal about a given disease, its manifestations, and its responses to treatment. This is especially so if the case is a "classic" one that has the features accepted as characteristic of the condition and is worked up in a manner that provides illustrative and consistent supportive data. The traditional hospital grand rounds consists of lessons illustrated by an individual case, as brought out by an experienced clinician educator.

Many journals regularly publish case-based educational articles based on grand rounds presentations or clinical-pathologic conferences. Others, like this one, publish descriptions of particularly characteristic and instructive cases as educational features. RESPIRATORY CARE's "Teaching Case of the Month" feature[28]—which appears in issues that are not thematic or devoted to conference proceedings—presents exceptionally well characterized cases of conditions, findings, responses to intervention, or outcomes, which serve as springboards for concisely written discussions of the teaching points they raise. These reports are distinguished from the typical case report as discussed above, which presents something new. The Teaching Case of the Month serves as a vehicle for review and instruction about known entities pertinent to the Journal's readers. Like a review article, overview, and update, it synthesizes existing knowledge rather than reports novel findings.

Writing a case report can be educational for the author as well as for potential readers.[8,10,11] Whether in the context of reporting something potentially new or presenting an instructive example of something well known, the author's first and most important task is to read extensively on the topic.[10] This will probably involve more than a

MEDLINE search, and will include referring to textbooks and monographs. Perhaps more than with some other manuscript categories, writing a case report will probably also require an actual visit to a medical library. First reports of conditions or procedures will probably have been published in volumes older than those available electronically. Spending some time in the library stacks can yield unexpectedly useful sources, and is a rewarding rite of passage for the would-be author of any scholarly work.

Components of a Case Report

Case reports are shorter than most other articles. After presenting the patient information of interest, they make a small number of points and cite a modest number of well-chosen references. The 4 components of a typical case report are introduction, case summary, discussion, and references.

The introduction should be a paragraph explaining what the paper is about: "We are presenting a case of. . . , which is instructive because. . . . " If definitions or a basic description of a syndrome are necessary for the reader's understanding of the case summary, these should be provided in the introduction.

The case summary is the focus of the manuscript and should provide as much detail as necessary to demonstrate the features that make the author's case. All data pertinent to this demonstration should be included, omitting extraneous material. Depending on what is being reported, a table or one or more figures can be very helpful (or even necessary) here. To include everything necessary and nothing irrelevant is a difficult task that cannot be done right the first time without help. Collaboration or consultation with someone experienced in the subject of the report is always a good idea, and mandatory for first-time authors.

The discussion amplifies on the case itself in pointing out and explaining its unique or otherwise important aspects. This section should start with a brief statement summarizing the reason for reporting the case. This should be followed by a concise description of the disease, complication, procedure, or treatment illustrated, including any features that were not present in the case reported. If the report focuses on a particular disease or condition, there should be a brief discussion of the differential diagnosis and of ways to separate the reported entity from others with which it might be confused. The discussion should finish with a concise statement of the lesson to be learned from the case.

The references listed at the end of the case report are not merely a random sampling of previously published work on the subject. They should provide additional general information for readers interested in more detail than can be included in the report, and they should back up any specific or controversial points stressed. Reference citations should be specific. In a book citation, the relevant pages should be cited rather than simply the names of the book and author(s). If a previously reported but rare condition is being described, it is often desirable to cite the original publication describing it—even if this is in another language or from an obscure (but verifiable) source. However, the situation is different for references to background material on the topic such as review articles or textbooks. These should be generally available and as recent as possible. It is no help if the background article cited is in another language or inaccessible to the interested reader. One should cite enough references to provide background for the major points of the paper without duplication. In some cases this will require only a handful of references, while in others 20 or more will be necessary; the usual number is somewhere between those extremes.

Issues of Patient Confidentiality

Authors of case reports must be cognizant of the need to protect patient confidentiality, and specifically to safeguard protected health information, as defined by the Health Information Portability and Accountability Act (HIPAA).[29,30] The latter is defined by HIPAA as "any information that is entered, created, or received by health care providers that relates to the past, present, or future physical or mental health of any individual or to the provision of health care to that individual and that identifies the individual."[30] Although HIPAA does not specifically address case reports, careful consideration of 2 areas relating to patient confidentiality will help to protect patients who are the subjects of case reports, and to avoid violations of both the intent and the letter of the law.

First, specific patient identifiers should not be used. Only information pertinent to the topic of the report should be included. Even though names, addresses, and other specific patient identifiers are not included, patients should grant permission for the use of data about them. Some reports are written after the patient has died, or in other circumstances in which neither the patient nor legal next of kin is available to grant permission. However, whenever possible, permission should be sought from the patient or an appropriate surrogate for use of the information in the case report. Most institutions have consent forms for this purpose.

Second, information obtained in the course of caring for a patient (practice activity) is considered differently from information obtained from a patient for the purpose of creating knowledge extending beyond that individual patient (generalizable knowledge), which meets the definition of research. Research on human subjects must be carried out according to strict and very specific requirements and requires approval by the institutional review board (IRB) of the health care facility in which it is done.

Thus, if the author of a case report wishes to carry out a special protocol or otherwise gather data that would be in addition to what would be generated in the course of caring for the patient, IRB approval is necessary, as well as the patient's authorization. However, reports that simply document what was found, or what occurred during the usual evaluation, management, and follow-up of a patient, do not require IRB approval.[31,32] These statements apply only to single case reports: retrospective studies, including case series,[14] constitute research and require IRB approval.

Authorship

Anyone can write and publish a case report—anyone, that is, who is motivated to expend the effort required, who participated in the care of the patient being reported,[30] who is willing to follow the steps described in this article, who can write clearly, and who has access to the necessary resources. These last include both the capability to thoroughly review the relevant literature and appropriate mentorship and consultation.

A single individual can author a case report if he or she has sufficient writing experience and expertise in the subject, and if input from others that is crucial to the report is not required. In practice, 2 or more authors are usually necessary, especially if the primary author does not meet those criteria. Only those persons who actually worked on the manuscript, without whose contribution it could not have been written, should be listed as authors. Rarely are more than 3 or 4 authors really necessary on a case report, and to grant authorship status to everyone who was involved in managing the patient is inappropriate. Those who helped in caring for the patient or who provided helpful information or advice but who did not actually help to write the paper should be thanked in the acknowledgments section.

I recommend settling everything about authorship before the writing even begins. Sometimes a number of people express initial enthusiasm for co-authoring the report but end up not really doing anything. I suggest deciding things at the onset, as illustrated in this scenario: "These are the 3 people who will be listed as authors: X will collect all the patient information, do the actual writing, and be listed first; Y will meet with X as needed to go over the notes and give advice on the references and writing; and Z will chase down that classic article by so-and-so, take care of the illustrations, and review each draft of the paper."

Authors' names should be listed in the approximate order of their contributions to the report, with the senior author (mentor) listed last. Each author's full name ("Robert N Jones Jr" rather than "Bob Jones") and official credentials ("RRT" rather than "RCP") should be used, and each person listed should approve both this listing and the content of the manuscript before submission.

Table 1. Ten Common Pitfalls in Case Report Writing

1. Inexperience
2. Insufficient documentation
3. Tunnel vision
4. Bad care
5. Bad idea
6. Inadequate focus
7. Inappropriate format
8. Poor writing
9. Ineffective illustrations
10. Poor use of references

Common Pitfalls in Writing Case Reports

Like most peer-reviewed journals, RESPIRATORY CARE accepts less than half of the unsolicited manuscripts it receives. Case reports are no exception, and rejected manuscripts tend to have several characteristics that separate them from their successful counterparts. Table 1 lists 10 common but avoidable pitfalls in case report writing, each of which I will discuss briefly here.

Inexperience

A case report can be an excellent project for a first-time author.[33] Its scope is limited and its format straightforward. However, most clinicians have had little formal training in scientific writing. To overcome this problem I recommend 2 measures: read lots of published case reports, and get help. Reading previous reports in the journal to which the manuscript will be submitted will familiarize the author with their format, appearance, style, and length. And there is no substitute for a mentor when it comes to preparing and submitting one's first manuscript. Although faculty members at universities and teaching hospitals are usually most experienced in this role, plenty of successful case reports have come from community health care facilities and community college programs. Someone who has published a similar article, an experienced instructor, or one's medical director would all be good possibilities.

Insufficient Documentation

One of the most common reasons case report manuscripts are rejected is insufficient documentation of the case. For the case to be "reportable" the diagnosis or phenomenon of interest must be definite, and not just what the author concluded to have been the case. Documentation for purposes of publication, with its implications for new knowledge and education, must frequently be more extensive and more rigorous than that encountered in everyday practice. If a syndrome is described in the source literature as having a given number of symptoms, physical features,

or laboratory findings, all of these should be present. If a manifestation or complication is presented as illustrating a particular phenomenon or sequence of events, as much "proof" should be offered as possible.

Tunnel Vision

This is a difficult disorder to avoid, or to diagnose in oneself. It results from a lack of familiarity with usage or practice outside one's own hospital or geographic area. An extraordinary or previously unknown case in one practice setting may be well known and extensively documented in another. The avoidance of tunnel vision is one reason for becoming thoroughly familiar with the literature before beginning to write. Another manifestation of tunnel vision is the use of local jargon that is not part of general clinical or scientific usage. Every clinic, intensive care unit, and training program has its own acronyms and local clinical folklore. Although these may facilitate communication on the job, they should be kept out of a paper for publication that will be accessed worldwide.

Bad Care

Some outcomes or complications submitted as case reports do not occur as unique spontaneous events but as results of poor patient management. Unless the intention was to illustrate this for teaching purposes, it would be difficult for the Journal to justify publication of such a report and thus give the appearance of approving the patient care described.

Bad Idea

Occasionally, a case report is submitted that is based upon a faulty understanding of physiology or a potentially dangerous treatment. Just because it appeared to work once does not necessarily mean it is a good idea. Here the fault usually is inadequate background research into the topic, or failure to seek advice from someone with more experience.

Inadequate Focus

A case report is a concise document that makes a specific point or illustrates a particular finding. It should be focused on its primary message. This is not to say that data should be omitted that do not support the intended diagnosis, but rather that the report needs to concentrate on the issue at hand. Clinical information that does not relate to the subject of the report—such as, in most cases, the patient's family, social, and medical history, or laboratory data obtained for other purposes—will interfere with communicating the main message unless it relates directly to that message.

Inappropriate Format

An author should aim to submit a manuscript that resembles the articles the target journal publishes. If the case reports appearing in a particular journal generally occupy only about 2 pages, it is unlikely that that journal will publish a manuscript containing several times that much material. Though failure to adhere to a journal's published instructions to authors may not cause a manuscript's outright rejection, this oversight is unlikely to impress the editor favorably and will almost certainly delay review and publication.

Poor Writing

Prospective authors should not refrain from submitting a case report because they lack a degree in English or journalism. Bad writing generally does not cause a manuscript to be rejected outright. However, effective communication is essential in science, and poor writing may tip the balance unfavorably if the paper has other potential problems. Those who are weak in writing should consult published sources[5,6,9,22] and seek help with the writing. An author whose primary language is not that in which the journal is published would be well advised to have a native speaker review the manuscript prior to submission.

Ineffective Illustrations

Many cases depend on illustrative material such as chest radiographs, ventilator waveforms, or photomicrographs to make their main points. Illustrations that are unclear or that do not show precisely the intended feature weaken a manuscript and may doom it to rejection. Professional help is recommended. Journals usually have very specific requirements for halftones and other figures, especially if these are to be submitted electronically. Careful reading of the journal's manuscript preparation guide and, if necessary, consultation with the journal's editorial office prior to submission can prevent wasted effort and avoid problems with complex or unusual illustrations.

Poor Use of References

A case report's references are often its weakest part. Finding the right references is crucial in documenting a new observation, and is central to the author's function as a teacher. Cited references should not be just a convenience sample of articles and books relating to the subject, but rather a source for more detailed information or the corroboration of specific points.

Table 2. Ten Tips for Increasing the Likelihood That Your Case Report Will Be Accepted for Publication

1. Get help
2. Document the case thoroughly
3. Justify any new technique or intervention
4. Put in the time necessary to do it right
5. Get the basics right the first time
6. Prepare the illustrations carefully
7. Make the references count
8. Have someone else read the manuscript
9. Check everything twice before submitting
10. Be prepared to revise

Avoiding the Pitfalls

Whether a case report will be accepted for publication depends only partly on the uniqueness or potential teaching value of the case itself. A lot depends on how well the manuscript is written and how well it conforms to the target journal's requirements. Table 2 lists 10 straightforward steps for increasing the likelihood that a case report will be accepted. I will comment on each of them. Discussion of additional factors that may affect the journal's decision appears elsewhere in this issue.[3,4]

Get Help

Someone thinking of writing up a case for publication should discuss it with certain other people before proceeding too far with the project. This will have 2 potential benefits. First, it may yield valuable additional information pertinent to the case, and will almost certainly help an inexperienced author produce a more authoritative, better-written manuscript. And, second, it will avoid potential conflicts about authorship and other issues among other clinicians who participated in the care of that patient. The primary physician or consultants involved in the patient's management need not necessarily be co-authors (depending on whether they meet the criteria for authorship, as discussed earlier), but they should know of the plan to write up the case. Often, one or more of these individuals can be a vital source of needed information and an important contributor to the paper.

When a prospective author is uncertain about the appropriateness of the case for a particular journal, the most direct and potentially helpful move is to call or e-mail the journal's editorial office for advice.[2,3,10] Editors and other staff are used to such inquiries, and they can sometimes prevent a lot of unneeded or misdirected effort. Contact information appears on the masthead pages of each issue of RESPIRATORY CARE, as well as on the Journal's web site (www.rcjournal.com).

Document the Case Thoroughly

Most patients do not display every feature of a syndrome or disease the textbooks describe, and everyday practice often involves making decisions on a more-probable-than-not basis rather than with absolute certainty. However, in a case report the certainty with which a diagnosis is established or responses to an intervention are documented generally must exceed that required for clinical practice. It is not enough to conclude that pulmonary embolism is *probably* what the patient had, or that the improvement in arterial oxygenation was *most likely* due to a change from one ventilator mode to another. For a case report, one has to demonstrate these things convincingly.

Only pertinent data should be included in the case summary, but those data should be precise and complete. Do not simply say, "The patient's blood gases improved." Give the actual values for pH, P_{aCO_2}, and P_{aO_2} before and after the intervention described, along with the fraction of inspired oxygen (F_{IO_2}), elapsed time, and any other changes that were made.

Because of the need for better documentation, as compared to what may be done in ordinary patient care, it is important to identify the case as of exceptional interest and "potentially reportable" as early in the course as possible. This need for more data than is typically obtained clinically is one reason why current cases are better suited for case reports than cases encountered in the past, the records of which are typically incomplete. Recognizing early that a patient may become the subject of a case report also facilitates HIPAA compliance and the obtaining of informed consent.

Justify Any New Technique or Intervention

If the case report is intended to demonstrate a new procedure or device, it is important to convince the reader that the new procedure or device represents a potential advance.[3] The author of such a report should consider each of the following questions:

- Is it needed? (Are current methods inadequate?)
- Is it logical? (Does it make good theoretical or physiological sense?)
- Does it work? (Has it been demonstrated that it actually does what it is supposed to do?)
- Is it safe? (Is there added risk over standard methods, and, if so, is the potential benefit worth it?)
- Is it an improvement? (Has it been shown to be better than what was available before?)
- Is it cost-effective? (Is the improvement likely to be worth the added time, effort, or expense?)

The literature is replete with reports of ill-advised, dangerous, or expensive devices and procedures that found their way into print simply because they were new and different.

Put in the Time Necessary to Do It Right

Writing a good case report takes at least as much bookwork and elbow grease as completing a college term paper. The would-be author should expect to put in extra time outside of usual work hours. Incompletely researched and hastily prepared manuscripts are less likely to make it through the peer review process successfully. However, putting in the necessary effort is definitely worth it. Anyone who has had a case report published will attest to the satisfaction that comes with seeing the work in print.

Get the Basics Right the First Time

There is no excuse for submitting a manuscript that does not conform to the journal's instructions for authors, or that is obviously not the kind of subject matter the journal publishes.[34] This can be avoided by simply *reading* the journal. Before submitting a case report to RESPIRATORY CARE the author should read the last half-dozen such reports published in the Journal. Good general sources are also available for writing manuscripts for the medical literature.[22,35,36]

Prepare the Illustrations Carefully

Although the value of some cases hinges on features demonstrated on chest radiographs or tomograms, these and other figures should not be included unless they add something to the report. It is a good idea to go over the radiographs with a radiologist, so that the best views can be selected for what is intended, and also so that correct technical and anatomical terminology will be used. Photographs, whether of radiographs, patients, tissue specimens, or apparatus, should be of professional quality. A photograph in which a patient is recognizable requires that person's permission for both taking and publishing the picture. Radiographs, photographs, and other images should be cropped so that they show the features of interest without including unnecessary or distracting material.

Most journals now accept figures in the form of electronic images. Such journals provide detailed information on acceptable formats and other aspects of submission, and their instructions need to be followed to the letter. In many cases hard copies will be needed as well.

The use of any figure borrowed from a book, journal, or other copyrighted source requires written permission from the copyright holder. An increasing number of publishers require that authors pay a fee for that permission, and unfortunately the fees can be substantial. Most journals require that the authors have permission to reproduce any borrowed figures before they will accept the manuscript for review.

Make the References Count

Each reference cited in the case report should serve a specific purpose. A report of a rare condition or occurrence should cite its original published description, if it is available, but need not list multiple subsequent reports unless they include specific features the author wishes to emphasize. Except perhaps for a key initial report, do not cite references to publications in other languages unless there is nothing appropriate to be found in the English literature. Because case reports must be brief, references to reviews or book chapters on the condition reported that are readily available should be provided for readers who want to read in more depth on the subject. Citations to books should be from current editions and indicate the specific pages of interest.

References should not be cited without actually being examined by the author, either physically or electronically. Cited articles do not always contain the information suggested or justification for conclusions drawn by other authors. Misspelled author names, erroneous page citations, and even completely bogus references are all too common in published sources. The aspiring author should resolve to submit a manuscript with an error-free reference list.

Have Someone Else Read the Manuscript

A colleague or local expert not involved in the case can provide potentially valuable peer review of the manuscript before it is submitted. Such an individual can be more objective than the authors, who may overlook inconsistencies and unclear writing because they are so close to the project. If not everything in the paper is completely clear to that consultant, or if additional information seems needed, revision at that stage may substantially improve the manuscript's chances of being accepted for publication. If a pre-submission consultant provides important suggestions for improving the paper, he or she should be thanked in the acknowledgments section.

Check Everything Twice Before Submitting

The target journal's manuscript preparation guide[37] should be re-read carefully before the paper is submitted. It should be every author's personal goal that the final manuscript submitted for publication not contain a single typographical, spelling, or organizational mistake.

Be Prepared to Revise

Virtually no unsolicited manuscripts are accepted for publication without revision. The author will probably receive

several pages of comments and suggestions from the reviewers. If the manuscript is not salvageable, the editor will not be shy about saying so. A manuscript that is not rejected outright would very likely be accepted for publication if satisfactory responses were made to the concerns of the reviewers. The author should consider revision the final step in the publication process[38] and should welcome the reviewers' comments as an opportunity to improve the paper.

Summary

A case report will not have as much potential impact on the science or practice of health care as a randomized controlled trial or other research project. However, it may be the only way to make others in the field aware of unusual presentations or complications, and it is a time-honored vehicle for teaching others. New syndromes, manifestations, associations, complications, or outcomes are appropriate subjects for case reports, as are typical and exceptionally well-documented examples of known entities that are relevant to a journal's readers. Being aware of common mistakes in case report writing, and taking deliberate measures to avoid them, may help aspiring authors to submit manuscripts that have a better likelihood of acceptance for publication.

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REFERENCES

1. Kljakovic M. Single cases in general practice and general medical journals. Aust Fam Physician 2002;31(7):669–673.
2. Pierson DJ. How to write a case report. Respir Care 1980;25(9):925–927.
3. Pierson DJ. How to write a better case report. Respir Care 1982; 27(1):29–31.
4. Roland CG. The case report. JAMA 1968;205(5):281–282.
5. DeBakey L, DeBakey S. The case report. I. Guidelines for preparation. Int J Cardiol 1983;4(3):357–364.
6. DeBakey L, DeBakey S. The case report. II. Style and form. Int J Cardiol 1984;6(2):247–254.
7. Squires BP. Case reports: what editors want from authors and peer reviewers. CMAJ 1989;141(5):379–380.
8. Iles RL, Piepho RW. Presenting and publishing case reports. J Clin Pharmacol 1996;36(7):573–579.
9. McCarthy LH, Reilly KE. How to write a case report. Fam Med 2000;32(3):190–195.
10. Wright SM, Kouroukis C. Capturing zebras: what to do with a reportable case. CMAJ 2000;163(4):429–431.
11. Khan KS, Thompson PJ. A proposal for writing and appraising case reports. BJOG 2002;109(8):849–851.
12. Hess DR. What is evidence-based medicine and why should I care? Respir Care 2004;49(7):730–741.
13. Durbin CG Jr, Schwenzer KJ. The spectrum of respiratory care research: prospective clinical research. Respir Care 2004;49(10):1165–1170.
14. Hess DR: Retrospective studies and chart reviews. Respir Care 2004; 49(10):1171–1174.
15. Rubenfeld GD. Surveys: an introduction. Respir Care 2004;49(10): 1181–1185.
16. Hoffman JR. Rethinking case reports. West J Med 1999;170(5):253–254.
17. Martyn C. Case reports, case series and systematic reviews. QJM 2002;95(4):197–198.
18. Morgan PP. Why case reports? CMAJ 1985;133(5):353.
19. Coccia CT, Ausman JI. Is a case report an anecdote? In defense of personal observations in medicine. Surg Neurol 1987;28(2):111–113.
20. Morris BA. The importance of case reports. CMAJ 1989;141(9): 875–876.
21. Vandenbroucke JP. In defense of case reports and case series. An Intern Med 2001;134(4):330–334.
22. Huth EJ. Writing and publishing in medicine. Baltimore: Lippincott Williams & Wilkins; 1999:103–110.
23. Ghamra Z, Stoller JK. Basilar hyperlucency in a patient with emphysema due to hypocomplementemic urticarial vasculitis syndrome. Respir Care 2003;48(7):697–699.
24. El-Khatib MF, Kiwan RA, Jamaleddine GW. Buspirone treatment for apneustic breathing in brain stem infarct. Respir Care 2003; 48(10):956–958.
25. Manali ED, Saad CP, Krizmanich G, Mehta AC. Endobronchial findings of fibrosing mediastinitis. Respir Care 2003;48(11):1038–1042.
26. Stoller JK, Hoffman RM, White RD, Mee RB. Anomalous hepatic venous drainage into the left atrium: an unusual cause of hypoxemia. Respir Care 2003;48(1):58–62.
27. Huseby JS, Legault S. Radiographically occult right main bronchus intubation with a Fastrach laryngeal mask airway endotracheal tube. Respir Care 2003;48(5):517–518.
28. Benditt JO. Announcing a New RESPIRATORY CARE section: teaching case of the month. Respir Care 2004;49(8):895.
29. Stewart KJ. Respiratory care in the computer age. Respir Care 2004; 49(4):361–364; discussion 364–366.
30. United States Department of Health and Human Services. Summary of the HIPAA privacy rule. Available at http://www.hhs.gov/ocr/hipaa. Accessed August 11, 2004.
31. Johns Hopkins Medicine, Institutional Review Boards, Single Case Report Policy, May 2, 2003. Available at http://irb.jhmi.edu/Guidelines/singlecasereportpolicy.html. Acessed August 11, 2004.
32. Michigan State University, Office of Research Ethics and Standards, Clinical Case Report Policy, March 1, 2004. Available at http://humanresearch.msu.edu/regs/ucrihs_policies/.Case%20Report%20SOP.pdf. Accessed August 11, 2004.
33. Kittredge P. What can respiratory therapy practitioners write for publication? The case for case reports (editorial). Respir Care 1978;23:669–670.
34. Pierson DJ. The top 10 reasons why manuscripts are not accepted for publication. Respir Care 2004;49(10):1246–1252.
35. Byrne DW. Publishing your medical research paper. What they don't teach in medical school. Baltimore: Lippincott Williams & Wilkins; 1998.
36. Gustavii B. How to write and illustrate a scientific paper. Cambridge UK: Cambridge University Press, 2003.
37. Guide for authors. Available at http://www.rcjournal.com/author_guide. Accessed August 11, 2004.
38. Pierson DJ. Research and publication in respiratory care (editorial). Respir Care 2004;49(10):1145–1148.