Academic writing in radiology

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Introduction

Academic writing in Radiology in modern-day South Africa is not easy. Or so it seems. The *South African Journal of Radiology* (*SAJR*) is a reflection of this. Recent editions show that although the subject matter published is interesting and varied, the number of contributing authors relative to the number of articles is few. Often it is the rotating guest editor himself who is the co-author of several of the articles in each issue and who has 'co-opted' articles from departmental colleagues and registrars or other members of his own practice (as I had to do for this edition!). This is due to the fact that there is not a vast bank of already-available articles from authors elsewhere from which the best and most relevant and interesting can be chosen for inclusion and publication. Then there is a small number of authors who do seem to contribute regularly of their own volition. Generally these authors have also published work in journals other than the *SAJR*. Is it that they are 'born writers' who thrive off the sharing of knowledge and experience, or do they have some hidden 'narcissistic' motive such as bolstering a CV or showing off some unusual talent apparently lacking in the average radiologist? I am a relative newcomer to academic writing, having been actively involved for only the last 2 years of a 13-year radiology career. I would like to share with you my own motivations behind academic writing and to give you some guidelines based on my experience regarding how to get started, if you have not already done so.

Gathering motivation

I started my first article back in 1994 whilst still employed in the academic world. It was a simple case report on nothing of any major radiological impact, one of those 'gee-whiz' cases we all see from time to time. It involved a paramagnetic MR artefact created around the head of a woman due to the presence of clay-impregnated hair braids. I thought this to be an unusual enough artefact to warrant publication and so I started writing the report. This project, along with several others far less advanced at that stage, was inevitably shelved. Seven years later I find myself in private practice. One day while cleaning out my office (a very necessary but all too rare exercise), I happened upon the half-finished article, and in a moment of inspiration (or lunacy) decided to finish it and send it to the *American Journal of Roentgenology* on the assumption that the Americans would love something with an 'African' flavour like this. To my utter amazement they accepted it, albeit revised into a lesser format, and it was duly published.[1] I had in the meantime been contemplating writing a number of other papers, but the motivation had really been lacking — until the time I received that first letter of acceptance. Then everything changed, and I have been 'on a roll' ever since. Following on this initial success I have had several further acceptances, some even without revision, in various journals both locally and overseas, with several more awaiting peer review as this is being written. The important point here is that I have at last 'broken the back' of academic writing, and at present I find that the more I do, the easier the process becomes. It is still difficult to write as I have to find the time between work and family commitments, often long after the rest of the family is in bed at night. But what keeps me motivated in this?

Although I am in full-time private practice I guess I am a closet academic at heart. I have always enjoyed teaching but get very little opportunity to do so. On the few occasions that I have given a lecture or tutorial I find that there is a lot of preparation involved in sharing knowledge with only a few for a brief period of time, with a very high chance that my pearls will be forgotten shortly after the lecture anyway. Therefore my first motivation for writing is that I can share my knowledge and experience with as wide a target audience as possible. I can do so in my own time, usually with no added pressure of a deadline. Furthermore I do not have to provide a separate set of lecture notes as the article is already in written format. These articles generally involve either simple case reports or subject reviews. This accounts for most of my writing to date for local journals or periodicals.

When I come across a new or unusual case or new technique I go

through the literature to see whether this has already been described and if so exactly where it has been described (i.e. radiological versus non-radiological literature). If this shows a 'gap' in the world literature on a particular topic then I will pursue it and try to report on the subject. Recent examples of this in our practice have included our description of the transarterial use of abciximab (ReoPro) in acute thrombotic occlusions during neurointerventional procedures,[2] and the use of a microsnare for clot removal in intracranial vessels during neurointerventional procedures.[3] We were aware that others had used similar techniques elsewhere in the world but to date nothing had been written about the transarterial use of ReoPro for this particular indication, and that only one case report had appeared in the neurosurgical literature about the use of snares in the setting described, and so we decided to publish the first of such reports in the radiological literature. Here was yet another motivation for writing, namely to share our experience on a worldwide platform. Not only does this allow us to share knowledge, but it also gives recognition in international circles to the work that is being done in South Africa. Our Abciximab article has had some very positive feedback indeed from several centres overseas and we have had the privilege of seeing our work being quoted at international meetings recently as well.

One of our recent case reports even elicited a written reply in the literature.[4,5] This elated me somewhat as I knew that at least one person in the rest of the world had taken interest in what we had to say! We learned a thing or two from this author's reply and had the chance to respond to his reply as well. Yet another motivation is therefore the interaction with others that writing stimulates.

Note that I am using 'I' and 'we' interchangeably in this article. I have written a number of 'solo' articles, but more often a paper is the result of the collaboration between a number of colleagues, some of whom may be specialists in other fields. I will discuss this in more detail later.

So much for the altruistic and philanthropic motivations behind article writing. I am forced to be brutally honest here and admit that there is also an element of narcissism involved in publishing. I must admit that there are a number of 'thrills' related to such writing, starting with receipt of the letter (or e-mail) of acceptance, even if it requires a revision of the article, through to seeing the end product finally in print. This is undoubtedly for me the greatest motivation for starting (or finishing) the next article. It is also gratifying to now be able to add a second page to my hitherto uninspiring and limited curriculum vitae. And lastly let us not forget that accepted articles can earn much-needed CPD points as well.

So now that you have some insight into what motivates me in academic writing, and hopefully the first enthusiastic stirrings are beginning to show in you, let us see how to go about getting started in academic writing.

How to begin — the greatest hurdle

Start simple. We have the advantage in radiology in that we deal with images, and as the saying goes: a picture is worth a thousand words. A simple case report can involve an unusual finding or an excellent example of a typical one. Our recent report of a case of bronchiolitis obliterans[6] was written as it was an extremely good illustrative case of this not uncommon condition, with good imaging features that clearly demonstrated how this particular diagnosis was arrived at. This allowed a brief associated review of the condition using general references thereby avoiding an exhaustive extended literature review. This article took only a few evenings to complete. Our case of the hepatorenal syndrome was of a still rarer condition but again with excellent accompanying images, and was accompanied by a limited number of references attesting to the uncommon nature of the condition.[7] Some good images, a short history and brief discussion are all you need to get started.

Do NOT begin with a review article. You will definitely bite off more than you can chew and there is a high probability that you won't finish it. My two review articles that appeared in a recent edition of the *SAJR*[8,9] took considerable effort, not the least of which was wading through and listing between 40 and 50-odd separate references. A brief overview of a topic to accompany a case report is adequate to start with.

Format of an article

We are fortunate in this country in having the *SAJR* at our disposal for aspiring authors to start off with. Although seen more as a 'tabloid' than a 'journal' in some circles, its format as a non-peer-reviewed journal does allow considerable latitude in what can be published and how. Although

the *SAJR* has not previously required strict adherence to the usual guidelines for publications in scientific peer-reviewed journals,[10] it now requests that authors adhere to these accepted formats in the future. A suggested abbreviated format for the writing of a case report is given in Table I.

Table I. Abbreviated format for a case report

Introduction
Case report
Discussion

For a longer, more detailed description involving a series of cases or formal study one can expand the format as given in Table II.

Table II. Format for a formal study or series of cases

Abstract
Introduction
Case reports/Materials and Methods
Results (where applicable)
Discussion
Conclusion

Co-authors

Most articles in the peer-reviewed journals are usually the collaborative efforts of several individuals, sometimes to the point of being ridiculous. I fail to understand the need in some instances for eight or nine authors to report a single case report, but this nevertheless seems to be accepted practice nowadays. Co-authors can include anyone directly involved with the case from an imaging or clinical perspective. In the *SAJR* this is not limited to doctors alone. One of the major problems facing aspirant authors in radiology is obtaining clinical information, pathological reports or follow-up notes. By nature of our training we are experts at acquiring and interpreting images but not at acquiring or interpreting clinical records or laboratory results. Requesting such information, especially retrospectively, from clinicians or pathologists can sometimes be met at best with ambivalence and at worst with outright refusal. Try offering any related clinician co-authorship, not forgetting to add the possibility of acquiring some CPD points in the process, and see the dramatic reversal in attitude that sometimes occurs! This has the added advantage of fostering better relationships with your referring clinicians as well.

A co-author could also be a colleague, mentor or departmental head whom you might request to proof read the draft of the article to correct grammar or add a neutral perspective to your writing. This is particularly useful where English is not your mother tongue. It is mine, but my spelling and grammar are still atrocious! A second opinion on the subject matter may offer an alternative perspective, often resulting in the change of emphasis of one or other aspect of the article, or pointing out the need to clarify other issues. A perfectly justifiable way of acknowledging this contribution is again to offer co-authorship, even as the last author. Let me comment here on the listing order of authors. If the article is your idea or case primarily and you have done much of the writing and research then you should obviously be listed as the first author. Lesser contributions are acknowledged by being placed as second or subsequent authors. In our report on the use of the microsnare, my partner, Pieter Fourie, was mentioned as the first author despite the fact that I wrote most of the article and did all the accompanying research. This was done so as to acknowledge the fact that he had actually put the catheter into the occluded vessel and removed the clot himself and is therefore more deserving of the recognition attached to the report. These are some guidelines concerning the inclusion of multiple co-authors.

Putting it all together

Once you have decided on a case report or topic to be written about, have decided on the co-authors and their respective inputs, and have gathered the relevant clinical and imaging data, it is time to put pen to paper (or nowadays if you have the skill, finger to keyboard). Try to document the case fully as soon as possible after it is first seen, i.e. whilst it is fresh in everyone's mind. At this stage you can go into the literature to obtain references to assist your discussion or review. An excellent source of information nowadays is the Internet, in particular dedicated medical literature search engines such as Pubmed. Try to avoid referring to standard general radiological texts like *Grainger and Allison, Sutton* or *Daënert.* Use these texts by all means to start your literature search, but try to use more in-depth and original references. The *Clinics of North America* and *Seminars in Roentgenology* are good review journals and a good place to start. I believe the *RSNA Guidelines to Imaging Literature* are no-longer being printed, which is a great loss to many. But the Internet is a more than

ample substitute as a source of information on published works.

Individuals in the academic sector generally have easy access to medical library facilities. This becomes a problem in the private sector. Most university medical libraries will offer a subscription to ex-graduates of the university but at a cost and a variable level of service and interest. Again, one can often resort to the Internet for an initial literature search but in most cases all you will be privy to see will be an abstract of the article(s) concerned unless you subscribe to the journal(s) in which the article(s) appear. Don't go wild with references — this alone can put one off article writing. Once you start with long in-depth review articles then you would usually need a reference to accompany just about every statement you make in the article. This is a logistical nightmare.

Given the almost universal access to computers the manner in which you choose to 'write' is a matter of personal choice and skill. Initially I have to put pen to paper physically. I cannot start straight off by typing onto a computer, primarily because I cannot type. But this also allows me to start my article anywhere where my computer is not, and believe me when I say that I have done some writing in the strangest of places! This article, for instance, was started at the poolside of the Novotel Hotel in Chiang Mai, Northen Thailand (how's that for enthusiasm!), and mostly completed on the plane back home. My unsung heroines are without doubt my secretaries who are able to translate my illegible scrawl and produce an initial typewritten draft on the computer. I then take this first draft and correct and alter it on my own computer with the few computer skills I possess. The computer has, without doubt, revolutionised modern writing and I would certainly be nowhere near as prolific a writer as I am now without it. Similarly images can either be photographed and printed on plain photographic paper or can be digitised. The acquisition and manipulation of digital images has also revolutionised our ability to produce presentations and articles. Many journals are now permitting full electronic submission of articles which is faster, easier and very much cheaper. The *SAJR* also accepts articles and images in electronic format but with an accompanying hard-copy draft of the article itself. Always check the image resolution requirements of the journal concerned. The *SAJR* does accept compressed images in JPEG format, but most overseas journals require high-resolution TIFF, GIF or Bitmap images instead. The advantage of digital imaging is that this allows you to crop and enhance your images to your own satisfaction and requirements. These images can still be printed out on photo-quality paper on many standard inkjet printers. Always back-up your articles and images in some way such as on disc or second computer. Any computer can potentially fall victim to breakdown, lightning damage or theft, to name but a few.

Target readership

In this article I have concentrated largely on new authors writing for the *SAJR*. If you decide to send an article to an international journal, or even the *SAMJ*, then things get somewhat more complex. For a start, there must be strict adherence to the standard formats for publication in a scientific journal.[10] The exact format will differ from journal to journal, e.g. some require the provision of shortened titles or key words whereas others do not. Always check carefully beforehand concerning the format requirements of any given journal. Similarly the format of listing references can also vary between journals although this is reasonably consistent for most. Check how many copies of the article and accompanying images are required and how the images should be annotated.

Many articles are rejected immediately because of technical problems such as lack of double line spacing, incorrect number of copies, etc. Stick to the requirements given - NEVER deviate.

The next main hurdle is the peer-review process. This can take anywhere between 2 weeks and 6 months or longer to complete. Some journals will provide you upfront with an average time for the peer-review process, e.g. 2 - 3 months, but others will not, leaving you with a feeling that your article has been lost or forgotten (which can and does happen). Finally the required feedback is given. An acceptance without revision is rare. Inevitably some revision of the article will be required before final acceptance for publication requiring, in turn, some further work. But at least you have the added motivation of a positive reply. Many more articles are rejected than accepted by the international journals. This is not necessarily a bad thing as they will usually have been rejected following the peer-review process, and so will be returned together with various comments and recommendations despite having been ultimately rejected. I have learned a great deal from these comments. Unfortunately your article is at

the mercy of two or three unknown individuals some of whom may be more or less sympathetic towards your hard work. There is something of an element of 'luck-of-the-draw' in the peer-review process, but in fairness the reviewers are generally true experts in their field and have themselves published widely and are far more familiar with the whole process than many of the authors whose work they review. Don't throw the rejected article away in a fit of despondency! Make the recommended corrections and try again elsewhere. My recent article on the absorbable screws was rejected by the *AJR*, but with some useful comments. I then resubmitted it to *Skeletal Radiology*. The first reply from them suggested I make some changes and then resubmit it, which I did. The second reply (from the same reviewer) was, to be frank, awfully rude. Still believing the topic to be of some interest to some radiologist somewhere in the world I finally submitted it to the *SAJR* where you may judge it for yourselves.[11] This is not to say that all articles rejected by overseas publications should end up in the *SAJR*, but they may still have relevance and be of interest to local radiologists. Plus they will have the added advantage of having been peer-reviewed to add to the quality of the final publication.

Stick to one article at a time. I have found in the past that one's initial enthusiasm is eroded by starting work on too many different articles at once, with the result that none ever gets completed. Now that I am underway with the writing process I have several projects going simultaneously, all at different stages of evolution. But as a beginner I suggest that you rather start one and finish it before you start the next. I can assure you that the excitement of ultimately seeing your article in print will almost certainly galvanise you into trying another. And it gets easier thereafter.

In summary, let us go through some important points illustrated in this article:

- If you don't try, you will never succeed.
- Start small — a simple case report and/or brief subject review is enough.
- Start local — the *SAJR* is at your disposal and your are more likely to have your work accepted locally.
- Nevertheless, try to stick to the accepted universal article format as far as possible in order to become familiar with it.
- Describe a case of an unusual pathology, or one that has particularly good illustrative images in the case of a more 'common' pathology.
- Get others involved - it spreads the load, facilitates the gathering of data (especially clinical data), promotes enthusiasm and fosters better professional relationships.
- As a beginner start and finish one project at a time. You can very quickly lose control and enthusiasm with too many things happening at once.
- Go easy on the references initially and try to avoid quoting major general titles. This is a 'cop-out'.
- Get your article reviewed independently if possible . This will help to get your spelling and grammatical errors pointed out and may introduce a newer and better perspective on some aspect(s) of the article.
- If you are aiming your publication at a peer-review journal make sure that your topic has not already been described elsewhere, particularly in the radiological literature.
- For peer-reviewed journals make sure that you adhere strictly to the required article format and image presentation of the specific journal chosen.
- Do not be afraid or put-off by the peer-review process. See this in a positive light and learn from it. Your rejected but corrected article may be acceptable elsewhere.

And when all else fails and you are hopelessly abandoned by your academic muse then you can simply write an article about — well, how to write an academic article! I must admit that I will probably never have the opportunity to refer to my own writings so many times in one article again. What a boost to the ego!

Finally let me acknowledge the contributions of the unsung heroes and heroines, some of whom I have already mentioned above, to give you some idea of who else is involved in the production of our articles :

- My family, for tolerating my late nights and bad moods (and language) when my computer and printer go on the blink.
- My radiographers and theatre sisters who help me remember cases and trace my own data in our unit where my memory often (and I mean often) fails me.
- My secretaries, Esther, Lizl and Bernhadette who have the uncanny skill of being able to decipher my scrawl and translate it into legible and highly professional looking documents on their computers. (And this in between all the bookings, confirmations, appointments and other daily duties they perform!).
- Julia Casciola, production editor

for the *SAJR*, who somehow always manages to send me urgent proofs for review as I am leaving for overseas.

- The University of Pretoria Medical Library for providing many of the references we use in our writings. Your support is truly invaluable.
- My partners and colleagues for all their invaluable input into the work we document and articles we have produced.
- And lastly and most importantly to our patients, who provide us with the material we write about and who are for the most part totally unaware of their individual contributions to the academic medical world and ultimately to the benefit of current and future generations of fellow patients.

I salute you.

References

1. Duncan IC. The 'aura' sign: an unusual cultural variant affecting MR imaging. *Am J Roentgenol* 2001; **177:** 1487.
2. Duncan IC, Fourie PA. Catheter-directed intra-arterial abciximab administration for acute thrombotic occlusions during neurointerventional procedures. *Interventional Neuroradiology* 2002; **8:** 159-168.
3. Fourie PA, Duncan IC. Microsnare-assisted mechanical removal of intraprocedural distal middle cerebral arterial thromboembolism. *Am J Neuroradiol* 2003; **24:** 630-632.
4. Duncan IC, Fourie PA. Embolization of a bullet in the internal carotid artery. *Am J Roentgenol* 2002; **178:** 1572-1573.
5. Braun SD, Duncan IC, Fourie PA. Arterial embolization of a bullet (Letter and reply). *Am J Roentgenol* 2003; **180:** 281.
6. Sher BJ, Duncan IC. Bronchiolitis obliterans - an illustrative case following toxic fume exposure. *South African Journal of Radiology* 2002; **6**(4): 43-45.
7. Sher BJ, Duncan IC. Hepatorenal degeneration — a case report. *South African Journal of Radiology* 2002; **6**(3): 34-35.
8. Duncan IC. Fibromuscular dysplasia - imaging and intervention. *South African Journal of Radiology* 2002; **6**(3): 5-10.
9. Duncan IC. Venous angiomas of the brain - a review. *South African Journal of Radiology* 2002; **6**(3): 14-19.
10. The International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals. *Ann Intern Med* 1988; **108:** 258-265.
11. Duncan IC, Volkerz HH. Radiographic imaging following the use of absorbable internal fixation devices in orthopaedic surgery — the 'invisible' screws. *South African Journal of Radiology* 2002; **6**(4): 46-47.

Recommended reading

1. Day RA. *How to Write and Publish a Scientific Paper.* Philadelphia, Pennsylvania: ISI Press; 1979.
2. Barnes JM. Organization and structure of a scientific article. *CME* 1986; **4:** 61-67.