

Guidance on Good Practice in Authorship of Journal Publications

Guest Editorial

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Journal article authorship brings benefit because it demonstrates collaboration, is an avenue for sharing research results, improves evidence and increases the reputation of researchers and organisations. Authorship may also have value in the accumulation of requisite continuing professional development points. For individuals, particularly academics, journal authorship might be essential for career progression. In some countries journal articles are assessed by government-backed bodies to evaluate research quality in order to apportion funding to institutions accordingly^{1,2}. Not surprisingly, employers, industry, collaborators and others encourage medical radiation science professionals to collaborate and publish^{3,4}.

Authorship conveys responsibility and accountability for the quality and integrity of the published work⁵. With increasing demands to publish in teams there is a need to follow good practice in the identification, participation and recognition of authors. Aside from the intellectual benefits that multi-authorship brings, it is also invaluable for the translation of research into practice. Traditionally, medical journal articles were authored by sole or pairs of authors; however, in recent times there has been an increase in the number of authors per publication often with authors at various stages of their career. As more individuals become engaged with publishing the need for good practice in authorship becomes essential because authorship can be a contentious matter as disputes do occur⁶.

This guest editorial provides guidance on good practice in authorship based upon professional experience of the collective authorship and from published advice^{7,8,9,10,11}. Requirements of being an author have been defined by the International Committee of Medical Journal Editors (ICMJE⁷); they propose that authorship be based upon four criteria:

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; and
2. Drafting the work or revising it critically for important intellectual content; and
3. Final approval of the version to be published; and
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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With the criteria in mind it is fair to say an author would normally have been involved at all stages of the work. It is reasonable to suggest that authors might play prominent and then less prominent roles at various stages as the work progresses. It is also possible that an author could have joined the work late in the day, but made a critical revision thereby making a material difference to it.

Point 4, above, is interesting because it places specific responsibilities with *all* authors. Consequently all authors are responsible for the facts, their representation and also matters like plagiarism. With the criteria in mind it becomes clear that honorary authorships, perhaps because of seniority, should not occur¹². While honorary authorships have been commonplace for many years in some professions, they dilute credit, inflate credentials and can question the integrity of a researcher or research group. Honesty in authorship is critical. Consequently we suggest if you feel that there has been unethical practice or undue pressure placed on authors then you should speak to your ethics committee or senior staff member in confidence. Many journals now require a statement outlining the responsibilities and contribution of each listed author at the time of article submission.

Paradoxically to honorary authorship is ghost authorship. Ghost authors are those that make a significant contribution to a project and who would normally qualify for authorship but who are not listed as authors. Clearly this is not appropriate, as it breaks the rules of ICMJE. Perhaps the most common examples of ghost authors include:

- Statisticians who are part of initially modelling, analysis and interpretation.
- Scientific writers employed specifically to develop grants, proposals and communicate the results of a groups work. This should be differentiated from honorary authorship associated with English language translation.
- Industry partners whose authorship may cast doubt over conflicts of interest.
- Failure to approve authorship. Rather than list an author who qualifies for authorship without their permission, an author who has not approved a manuscript might be relegated to acknowledgements.

The order in which authors are listed is something that has been largely overlooked in medical radiation sciences, perhaps because our profession is, in academic terms, comparatively in its infancy. Here are some rules of thumb which might be helpful. The *first author* would have made the largest contribution. The *last author* and/or *senior author* (they might also be the Principal Investigator and/or the PhD first supervisor) would have participated in and overseen the whole work and they guarantee its authenticity¹³. Having said this, on occasion, the most senior author might be listed in a different place in the running order, e.g. second author. The *corresponding author* is the one who deals with any correspondence about the article after it has been published and they are often the person that submitted the article to the journal. The remaining *co-authors* (et al.) will have met the ICMJE criteria and often they would be in order of amount of contribution which they made; the order is commonly assigned by the first author in consultation with the supervising/senior author. On occasion the order of authors is alphabetical (using family/last name, e.g. Abbott H, Bennett J, Connett M, etc), as is the case in this Guest Editorial. In some cases the order of authors might be revised as the research progresses and this would be dependent on whether somebody took on a more prominent role, or otherwise.

Ideally, authorship should be agreed in the preliminary stages of research activity so that everyone knows their role in the project and there are no disputes. There might be templates available for assigning and recording authorship within organisations, e.g. universities. Finally, authorship should be confirmed formally as the final version of the article is submitted to a journal; all authors should have seen and approved this version. As part of the submission process some journals require a written statement about each author and what contribution they made. Many journals send an email to all authors as the article is submitted. This email confirms they are an author and it requests they alert the editor if they are not an author. Once the article has been appraised by the journal reviewers all authors must be involved in its revision. In reality, the revision is often led by the first and senior authors, in consultation with the other authors. Prior to submission of the revised article it should have been seen by all authors and approved by them. Conflicts of interest should also be declared, though typically these are made at the time of submitting the work to a journal. A conflict of interest might be associated with the finance which supported the research.

Good communication between authors at all stages is essential as this should minimise disappointment and disputes about authorship, this includes whether somebody will be an author and what place in the authorship order they will be. It is extremely important to avoid disputes after the article has been published¹⁴. Academic institutions often have organisational policies about authorship and how disputes might be resolved internally, especially where the manuscript is a supervised research student. Journals also have policies and procedures in place to resolve disputes. In the event of incorrect authorship a corrigendum correction can be published¹⁵. A corrigendum seeks to correct a publication or authorship error^{16,17}. Corrigenda should be seen as an *ex post facto* solution and they should be avoided. Like research itself, authorship has the best outcomes with advanced planning.

For those new to publishing it is recommended that they work with an experienced author / researcher. It is beneficial to provide early career researchers, whether academic or clinical, with the opportunity to participate in authorship because they can provide valuable input and also learn from experienced mentors. Research mentorship is a rich and rewarding learning experience. Both etiquette and process in publishing, including good practice in authorship, should form part of the research training, supervision and mentorship during PhD, MPhil, MSc, and Hons. by thesis supervision and beyond.

On occasion some people who have helped with the research may not go on to be an author, instead they would get an acknowledgment. Acknowledgements are given for specific reasons (e.g. helping with data collection); importantly those who are acknowledged would not have met the authorship criteria set out by ICMJE.

The process of dissemination by publication is a pillar of how we build and share knowledge. Research is not an ad hoc process and writing and authorship require careful planning. Authorship carries with it recognition and an assumption of contribution. It is valued by academics, clinicians and society at large. Maintaining the intrinsic value of authorship is inextricably linked to the validity of the processes for assigning it. Should authorship be devalued by poor or unethical practice knowledge will be the victim.

¹ <http://www.ref.ac.uk/>

² <http://www.arc.gov.au/excellence-research-australia>

³ Denham G, Allen C and Platt J, International Collaboration in Medical Radiation Science, *Journal of Medical Radiation Sciences*, doi: 10.1002/jmrs.158, in press

⁴ Ekpo E, Hogg P and McEntee M, A Review of Individual and Institutional Publication Productivity in Medical Radiation Science, *Journal of Medical Imaging and Radiation Sciences*, Volume 47, Issue 1, 13-20

⁵ Authorship: why not just toss a coin? Strange, K. *Am J Physiol Cell Physiol* (2008) 295(3):C567-C575

⁶ Dance A, When scientists collaborate on an experiment and a paper, it can be hard to decide who gets the credit and how much, *Nature*, 489, 591-593, (2012), doi:10.1038/nj7417-591a

⁷ <http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html>

⁸ Code of Practice for Research: promoting good practice and preventing misconduct. UK Research Integrity Office, September 2009, <http://www.ukrio.org/wp-content/uploads/UKRIO-Code-of-Practice-for-Research.pdf>

⁹ Birnholtz J, When Authorship Isn't Enough: Lessons from CERN on the Implications of Formal and Informal Credit Attribution Mechanisms in Collaborative Research, *The journal of electronic publishing*, Volume 11, Issue 1, Winter 2008, <http://dx.doi.org/10.3998/3336451.0011.105>

¹⁰ <http://research-ethics.net/topics/authorship/#summary>

¹¹ Sokol KD, The dilemma of authorship, *British Medical Journal*, 2008, 1, 336 (7642), 478. doi: 10.1136/bmj.39500.620174.94

¹² Wager E & Kleinert S (2011). Responsible research publication: international standards for authors. A position statement developed at the 2nd World Conference on Research Integrity, Singapore, July 22-24, 2010. Chapter 50 in: Mayer T & Steneck N (eds) *Promoting Research Integrity in a Global Environment*. Imperial College Press / World Scientific Publishing, Singapore (pp309-16)

¹³ Put my name on the paper: reflections on the ethics of authorship. McKneally M. *J Thorac Cardiovasc Surg*(2006). 131:517-519

¹⁴ <http://publicationethics.org/case/new-claim-authorship-published-paper>

¹⁵ <https://www.elsevier.com/editors/publishing-ethics/perk/corrections-to-the-record>

¹⁶ E.G. Hantouche EG, Akiskal HS, Corrigendum to "Toward a definition of a cyclothymic behavioral endophenotype: Which traits tap the familial diathesis for bipolar II disorder?", *Journal of Affective Disorders*, 96/3 (2006) 233–237. 10.1016/j.jad.2004.08.013

¹⁷ <http://www.nature.com/authors/policies/corrections.html>