

**Original Article**

# Do Medical Journals Provide Clear and Consistent Guidelines on Authorship?

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## Abstract

**Context:** Determining the authorship of scientific papers can be difficult and authorship disputes are common. Less experienced authors may benefit from clear advice about authorship from journals while both authors and readers would benefit from consistent policies between journals. However, previous surveys of authors have suggested that there are no universally known or accepted criteria for determining authorship.

**Objective:** To review instructions to contributors from a broad sample of biomedical journals to discover how much guidance they provide about authorship and whether their advice is consistent with one another and with international guidelines.

**Design:** Review and analysis of published instructions to authors.

**Setting:** Biomedical journals that publish instructions in English on the Internet.

**Methods:** I examined the instructions to contributors from 234 biomedical journals (randomly selected from the membership list of the World Association of Medical Editors and from Medline).

**Results:** Of the 234 instructions examined, 100 (41%) gave no guidance about authorship, 68 (29%) were based on the International Committee of Medical Journal Editors' (ICMJE) criteria, 33 (14%) proposed other criteria, and 33 (14%) said nothing except that all authors should have approved the manuscript. Of those instructions that were based on the ICMJE criteria, 18/51 (35%) cited an outdated version. Only 21 of the journals (9%) required individuals' contributions to be described.

**Conclusions:** Journals do not provide consistent guidance about authorship and many editors are therefore missing an important opportunity to educate potential contributors and to improve the accuracy, fairness, and transparency of author listing.

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## Introduction

A publication's list of authors or contributors tells readers who did the work, allows credit to be taken if it is good, and identifies those responsible if there are problems. It is therefore important that the listing is fair and accurate. It is not easy to estimate the frequency of authorship abuse, but a recent study of industry-sponsored trials found evidence of ghost authorship in 75% of papers.<sup>[1]</sup>

Guidance about determining authorship is available from a number of organizations including the Committee on Publication Ethics<sup>[2]</sup> and the Council of Science Editors.<sup>[3]</sup> Perhaps the best known guidance comes from the International Committee of Medical Journal Editors (ICMJE) in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals (URM).<sup>[4]</sup> However, the ICMJE criteria are not endorsed by all biomedical journals and are not universally known or accepted by researchers.<sup>[5-7]</sup>

Since I was checking the Instructions to Authors of a large number of biomedical journals for another project, I decided to review their guidance about authorship to see whether journals' authorship policies were consistent with one another and with published criteria.

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## Methods

A sample of 252 journals was identified (as part of another project to determine whether journals mention professional medical writers in their instructions to authors, which will be reported separately). These comprised the 12 journals edited by ICMJE members (which are well-known general journals such as *The New England Journal of Medicine* and *The Lancet*, and a number of

national medical association journals), a random sample of 120 journals whose editors are members of the World Association of Medical Editors (WAME) (from a total membership list of 763), and a random sample of 120 non-WAME members taken from the Medline database (produced by the United States National Library of Medicine which contained 18,673 journals at the time of the study). The random samples were taken by applying computer-generated random number lists to the WAME membership list and Medline journal list to obtain samples of 120 from each. Journals were excluded if they were obviously non-biomedical (eg, Medline includes journals on astronomy, horticulture, and ecology), did not publish original research, or did not make instructions to contributors available in English on the Internet. This left a total of 234 biomedical journals whose policies could be checked. Their instructions to contributors were downloaded from journal Web sites between February 24 and March 2, 2006.

## Results

### Quantitative Findings

The 234 instructions reviewed came from 9 ICMJE members, 117 WAME members, and 108 non-WAME, Medline-listed journals; 100 of these (41%) did not include any guidance about authorship. Of the other 134 journals, 68 (ie, 29% of the total and 51% of those that mentioned authorship) based their guidance on the ICMJE criteria. Twenty-six journals (11%) included a general reference or link to the ICMJE Web site and 25 (11%) included direct quotations from the ICMJE authorship guidance, while 17 (7%) contained paraphrased versions of the ICMJE criteria ( [Table](#) ). Thirty-three journals (14%) proposed their own criteria for authorship that differed, in some way, from the ICMJE criteria, while a further 33 (14%) did not provide guidance about authorship except for stating that all authors must approve the final version of the submitted manuscript. Eight journals (3%) set limits on the number of authors who could be listed (which varied from 6 to 12, with a median of 7.5 for original studies).

**Table. Instructions to Contributors**

No.	Instruction	Number of Journals (%)	Subgroups (%)
1	No guidance	100 (41)	
2	Reference or link to ICMJE	26 (11)	
2a	- current version <sup>*</sup>		13 (6)
2b	- old version <sup>†</sup>		9 (4)
2c	- vague wording		4 (2)
3	Uses ICMJE wording	25 (11)	
3a	- current criteria <sup>‡</sup>		16 (7)
3b	- old criteria <sup>§</sup>		9 (4)
4	Paraphrases ICMJE	17 (7)	
5	Own criteria	33 (14)	
	Authors must approve paper	33 (14)	
	<b>Total</b>	<b>234</b>	
**	Lists contributors	21 (9)	

*Refers to [www.icmje.org](http://www.icmje.org); <sup>†</sup> refers to version published in 1997 (eg, Annals of Internal Medicine, Lancet, NEJM) or earlier; <sup>‡</sup> criteria from post-2001 versions (includes "data acquisition" as qualifying activity); <sup>§</sup> criteria from pre-2001 versions (before addition of "data acquisition"); <sup>\*\*</sup> this category was not an exclusive one*

Of the 26 journals that cited the ICMJE URM, 13 provided a reference to the latest published version or Web site, 9 cited a previous version, and 4 mentioned the guidelines without providing a reference or link to them. Similarly, of the 25 journals whose instructions quoted from the ICMJE authorship guidelines, 16 quoted the most recent version, but 9 quoted an outdated version. (The URM were updated in 2001 when data acquisition was added as one of the activities that may qualify for authorship; they were further revised in 2003 but without any substantive changes to the 3 authorship criteria.<sup>[8]</sup>)

The ICMJE encourages editors "to develop and implement a contributorship policy" (ie, to list individuals' contributions to a project as well as their names and affiliations), yet only 21 (9%) of the 234 journals reviewed required such information (despite 29% of the journals claiming to endorse the ICMJE's requirements).

Of the 9 journals edited by members of the ICMJE, 5 quoted directly from the most recent version of the ICMJE authorship guidance, 2 cited it or provided links to the ICMJE Web site, 1 paraphrased the ICMJE criteria, and 1 referenced the ICMJE statement but noted that it "has some serious flaws" and therefore proposed guidance of its own.<sup>[5]</sup>

Journals whose editors were members of WAME were significantly more likely to mention authorship in their instructions (82/117 = 70%) than those who were not members (43/108 = 40%) (chi-square test,  $P < .001$ ).

## Qualitative Findings / Examples [additional material]

**1. No guidance.** Journals that gave no guidance about authorship tended to publish short instructions to contributors that focused on technical requirements for formatting and submission. These short instructions concentrated on manuscript preparation and were silent on topics such as the disclosure of competing interests and the requirement for ethical review of clinical trials. However, such instructions often included detailed information about how references should be formatted and illustrations prepared.

**2. General reference to ICMJE URM.** Journals in this category included broad statements in their instructions such as: "Submissions should be prepared according to the Uniform Requirements" or "Authors should conform to the general guidelines laid out in *Uniform Requirements for Manuscripts Submitted to Biomedical Journals*."<sup>[1]</sup>

Several journals cited outdated versions of the ICMJE document, for example:

"The manuscript should conform to the guidelines in *Uniform Requirements for Manuscripts Submitted to Biomedical Journals*, 5th edition, prepared by the ICMJE and published in *N Engl J Med*. 1997;336:309-315." and "The requirements of the journal are in accordance with the ICMJE *Uniform Requirements for Manuscripts Submitted to Biomedical Journals* (*BMJ*. 1991;302:338-341)."

Four journals used vague wording such as "*Current Surgery's* Instructions to Authors follow many of the standards included in the *Uniform Requirements for Manuscripts Submitted to Biomedical Journals*" or implied that the URM applied only to format, eg, "We ask that the manuscript is no longer than 2500 words and that the style conforms to that detailed in *Uniform Requirements for Manuscripts Submitted to Biomedical Journals*."

**3. Explicit use of ICMJE authorship criteria.** Some instructions mentioned the ICMJE authorship criteria but did not list them, simply stating, for example, that authors should ensure that they have "met the criteria for authorship established by the ICMJE." Others quoted the full authorship section from the URM (see appendix / text box). Several journals quoted the pre-2001 criteria, which did not include data acquisition as a qualifying activity for authorship.

**4. Paraphrase of ICMJE.** These instructions followed the spirit of the ICMJE criteria but did not adopt the exact wording. For example, "Authorship credit should be based on substantial contribution to conception and design, execution, or analysis and interpretation of data. All

authors should be involved in drafting the article or revising it critically for important intellectual content, and must have read and approved the final version of the manuscript." Another journal required authors to "state that they are responsible for the research that they have designed and carried out; that they participated in drafting and revising the manuscript submitted, which they approve in its contents."

**5. Journals' own authorship criteria.** Some journals provided their own criteria for determining authorship. These ranged from short statements such as "Each person listed as an author is expected to have participated in the study to a significant extent" to much more extensive guidance. For example, *The Physiologist* provides guidance that goes beyond that of the ICMJE:

"The Editors of the journals of the American Physiological Society (APS) expect each author to have made an important scientific contribution to the study and be thoroughly familiar with the original data. The Editors also expect each author to have read the complete manuscript and to take responsibility for the content and completeness of the manuscript and to understand that if the paper, or part of the paper, is found to be faulty or fraudulent, that he/she shares responsibility with his/her coauthors."

The ICMJE URM gives no guidance on how to determine the order in which authors or contributors are listed, simply stating that this should be "a joint decision of the co-authors." Instructions for *The Physiologist* state that authors should be listed "in the order of importance of their contribution to the study." Four other journals allowed joint first authorship. One stated that "if two authors have contributed equally to the work, this should be noted under the corresponding author information" while another allowed up to 3 authors to be "designated as 'first authors who contributed equally to this work' if the contributions of those individuals essentially constituted the majority of the work on the project." This journal also allowed the category "mentors who contributed equally to this work" to be used for "senior investigators, clinicians, or directors who provided the support and mentorship necessary for the success of the work."

Eight journals limited the number of authors who could be listed. One stated that "The number of authors on a manuscript should not exceed 10. Manuscripts exceeding this limit will be returned without review." Others were less draconian, stating, for example, "the number of authors of each paper should not be more than twelve; a greater number requires justification." Some journals set different limits for different types of article, for example up to 4 authors for case reports and 6 for experimental studies.

Rather than setting limits on the number of authors, some journal instructions encouraged inclusion. One stated "we ... want assurance that there is no one else who fulfils the criteria but has not been included as an author"; while another stated "anyone who makes significant intellectual contribution must be given authorship."

The final criterion of the ICMJE URM is that all authors should have approved the final version of the publication. This was the most frequently stated requirement among journals that provided no other guidance about authorship. Many journals require a statement in the covering letter that the submission has been approved by all authors. One set of instructions noted "It is taken for granted that the publication has been approved by all participating authors" and another that "manuscripts are accepted for review with the understanding that ... its submission for publication has been approved by all of the authors." Another stated that "submission is a representation that all authors have personally reviewed and given final approval of the version submitted."

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## Discussion

This study revealed considerable variation in the amount of guidance provided by journals about authorship. Only about 60% of the journal instructions included any guidance about authorship, such as a reference to the ICMJE URM, and only one third gave specific information (with the others relying on potential authors to consult the URM). Of those that did cite the URM, 35% referred to an outdated version. Altman noted even worse performance in a survey of 167 high

impact medical journals published in 2005. Of the 72 that mentioned the ICMJE URM, he found that 41 (57%) cited an obsolete version.<sup>[9]</sup>

One limitation of my survey is that it considered only journals whose editors belonged to WAME, or that were listed on Medline, and produce instructions in English on the Internet. This probably biased the sample toward internationally recognized and English language publications. Medline tends to list journals that are well-established, so the sample is likely to have excluded newer journals and those with small circulations. Membership of WAME is more global and inclusive, but well-established journals are still likely to be over-represented. The journal sample was originally made for another project assessing whether journals provide guidance in their instructions about the role of medical writers in developing articles, as recommended by a WAME position statement. However, the sample size and method of sampling seemed equally appropriate for examining journal guidance on authorship. The sample comprised 16% (120/763) of WAME members but <1% of the journals listed in Medline (120/18,673). However, the random sampling technique should have ensured that samples were representative.

As previously suggested, the ICMJE authorship criteria are not universally known or endorsed.<sup>[6,7]</sup> Forty percent of journals in the current survey made no mention of the URM and 14% of journals recommended their own criteria for determining authorship. It appears, in this respect at least, that the "uniform" requirements are not universally applied. Whatever one thinks of the ICMJE authorship criteria, this may create confusion for contributors (or at least for those who bother to read journal instructions), because it appears that journals do not agree on authorship criteria. For example, some journals attempt to limit the number of authors who may be listed, but this limit ranges from 6 to 12. Such variation might reflect practical differences across disciplines, but variation was found within a single field. For example, the *International Journal of Gynecology & Obstetrics* sets an upper limit of 6 authors for a research paper, while *Gynecologic Oncology* permits up to 7 and *Cancer* up to 10.

Cases submitted to COPE and anecdotal evidence from researchers suggests that authorship problems are not rare. There is considerable concern about the existence of ghost authors, especially when their absence hides the involvement of commercial research sponsors.<sup>[1,10]</sup> Journal editors are usually not in a position to police authorship abuse but they could play an important role in educating potential authors about their expectations. However, unless journals adopt more uniform policies, it will be hard to establish or promote consistent norms. Given the difficulties of determining authorship and of devising criteria that apply to every situation, listing contributions to a study and its publication has many advantages.<sup>[11]</sup> Not only does publishing information about individuals' contributions increase transparency, but also the process of gathering such information may also permit editors to detect ghost or guest authors and to educate authors about authorship criteria, especially if forms for collecting such information are well designed.<sup>[12]</sup>

Editors could play an important role in improving the accuracy, equity, and transparency of listing authors on biomedical publications and therefore in preventing authorship abuses such as ghost or guest authors. However, judging by the results of this survey of 234 mainly well-established, English-language journals, this opportunity is being missed by many journals. There is considerable evidence that lists of authors do not always accurately reflect the true authorship of the work. The COPE guidelines state that "Many people (both editors and investigators) feel that this misrepresentation is a form of research misconduct, and that honesty in reporting science should extend to authorship. They argue that, if scientists are dishonest about their relationship to their work, this undermines confidence in the reporting of the work itself."<sup>[2]</sup> Determining the authorship of scientific papers is not always straightforward and criteria are not uniformly applied or recognized. Journal editors could assist researchers by agreeing clear guidelines and educating potential contributors about these via their instructions. Editors' organizations such as CSE and WAME should take a lead in trying to obtain consensus among editors to agree on authorship criteria that could be applied universally. Academic and commercial institutions should then be called on to take an active role in implementing the guidelines and ensuring that researchers understand them. As with other forms of misconduct, deliberate abuse will probably

remain hard to detect and prevent, but clear guidance from journals and attention to the effects of different submission systems in obtaining authorship data<sup>[12]</sup> should reduce the problem.

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