



Changing Ethical Standards in Scientific Publication

“Truth is the drive at the center of science; it must have the habit of truth, not as dogma but as a process.” — Jacob Bronowski, *Science and Human Values* (1)

Scientific writing imposes upon the authors a grave responsibility to report truth and to do so in an ethical manner. Editors and publishers have long recognized the importance of ethical behavior. The *Memoirs of the Literary Society of Manchester* noted in 1785:

The sanction which the Society gives to the work, now published under its auspices, extend only to the novelty, ingenuity, or importance of the several memoirs which it contains. Responsibility concerning the truth of facts, the soundness of reason, in the accuracy of calculations is wholly disclaimed: and must rest alone, on the knowledge, judgement, or ability of the authors who have respectfully furnished such communications. (2)

Despite certain universal concepts, the standards or requirements of publishing, as other human endeavors, undergo natural evolution, and standards acceptable even 10–20 years ago are no longer acceptable. In recent years a number of organizations, including the Council of Science Editors (CSE), the International Committee of Medical Journal Editors (ICMJE), and the Committee on Publication Ethics (COPE) have published contemporary ethical guidelines addressing a variety of issues (3–5). These include research misconduct, redundant publication, fraud and plagiarism, conflicts of interest, authorship, privacy, and ethical approval of research. We, the editors of three major orthopaedic journals, wish to draw the attention of readers and contributors to several of these issues, namely redundant publication, plagiarism, conflict of interest, and ethical approval of research.

No one would take exception to the explosion of information in recent years. Approximately 8% of articles recently published in orthopaedic surgery appear to have some degree of redundancy (6). It is incumbent upon contributors to avoid redundant publication and also the more common practice of publishing multiple closely related articles [“least publishable unit (7),” “meat extender (8),” or “salami slicing (9)”]. These latter practices are often difficult to identify in a prospective manner because authors may change the order of authorship and particularly the corresponding author, submit to multiple journals, or submit at differing times. Material containing essentially similar aims or hypotheses, data sets, conclusions, and references will likely all fall within the framework of redundant publication. (Most editors make exception for material published in a second language when the first publication has appeared in print and can be noted and referenced.)

Plagiarism occurs when authors substantively report the work (unpublished or published) of others without properly crediting the original source. Such copying may take the form of presenting data or figures from other publications, copying paragraphs, or even verbatim reporting crucial original phrases. At the gray edges, individuals differ on what constitutes plagiarism (10). At a minimum it may involve copying key phrases, concepts, or images without quotations or citations, but at worst represents theft with legal ramifications (11).

Each of our journals has explicit policies dealing with conflicts of interest, and each requires the authors to specify in essentially similar manners the type of conflict. Perhaps the most common relate to the involvement of an individual with a commercial product being reported (12–17). While conflicts do not per se jeopardize the scientific validity, readers must be made aware of potential bias in reporting.

Standards of ethical review of research have undergone rapid evolution in the past 10–15 years, and continue to do so. Institutional review of human and animal research is now required in many, if not most, industrialized countries. Accordingly, many journals require statements of approval. One of our journals now requires a copy of the institutional review board approval (18). Each of our journals concurs with the requirement for such ethical approval.

We are committed to following contemporary ethical standards and will cooperate in these cases when appropriate. When we encounter a case of any ethical violation, each of us will at a minimum write the author for an explanation. Possible duplicate submissions will be sent in a blinded fashion to an independent reviewer for an assessment. Authors who violate these ethical standards are subject to a variety of sanctions (3,19). The particular sanction depends on the violation. Minor violations (e.g., failing to cite a previous author) might result in a letter to the author noting violation and current ethical standard, but major violations (e.g., fraud or frank plagiarism) might involve a sanction against future publication in our particular journal or even notification of the authors' institutions for their own actions.

Ethical standards promote high-quality research. We therefore believe it is crucial to draw attention to and follow such standards.

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