Scientific Misconduct, Retractions, and Errata

One of the least attractive aspects of being an editor is dealing with the possibility of scientific misconduct or fraud. Aside from the fundamental unpleasantness of the matter, editors are poorly equipped to evaluate possible misconduct since we neither have access to the raw data of submissions nor the time and manpower to acquire and analyze it if we did. Moreover, individuals who are much better positioned to identify research misbehavior are typically disinclined to do so. Similar to journals, the parent institution has no desire to have its reputation sullied, nor do collaborators, who have the added incentive of preserving the academic equity of publications in which they have been involved. Further, much scientific misconduct is not deliberate, but rather the result of unintentional error or ignorance of accepted standards for issues, such as duplicate publication or self-plagiarism. Although each instance of scientific transgression that is exposed casts a shadow of suspicion on the validity of the entire research enterprise, it is essential to reveal erroneous data or wrongdoing not only for basic integrity, but also so that it is not perpetuated in other publications or teachings.

It may be that there is something so sinister about misconduct that it attracts undue publicity and therefore an exaggeration of its prevalence. Indeed, in the current era of the Internet and multiple social media outlets, news of academic fraud attracts headlines and spreads rapidly. However, a brief perusal of PubMed citations under scientific misconduct reveals impressive evidence of the frequency and significance of this problem. A recent survey of British investigators revealed that 13% reported knowledge of colleagues “inappropriately adjusting, excluding, altering, or fabricating data” (1), and a meta-analysis of survey data found that 14% of respondents were aware of behaviors by others that distorted scientific knowledge, while 2% admitted such actions by themselves (2). Clearly, given the emphasis upon evidence-based medicine, this is a serious issue.

A variety of actions can fall under the category of scientific misconduct (3). The investigation itself may be totally unethical, such as the study evaluating the natural history of syphilis after the discovery of penicillin. Hopefully, such experiments have been abolished by the creation of institution review boards (IRBs), although IRB approval can be omitted or IRB rules circumvented by unethical investigators. More commonly today, scientific wrongdoing fall under one of several general groupings: fabrication or falsification, plagiarism, failure to obtain informed consent, violation of IRB restrictions, lack of disclosure of conflict of interest, duplicate publication, and perhaps failure to report misconduct on the part of others. Obviously, the gravity of misconduct varies, ranging from data fabrication and absence of informed consent to duplicate publication and self-plagiarism. Of greatest concern are transgressions that endanger patients or result in erroneous scientific information.

Just as the seriousness of scientific misconduct can vary, so can the certainty with which it is known to exist. As stated above, the evidence of wrongdoing is often difficult to uncover, and guilt is frequently hard to assign with confidence. It follows that the actions taken by editors and journals are also often variable. In fact, a spectrum of mea-
quires can be taken (4). The most common action is to post an errata indicating that corrections to the published manuscript are required. Typically errata relate to aspects of the paper that do not change the findings in a significant way. If issues of a more serious nature exist, an 'Expression of Concern' can be published conveying that the validity of an article is in question. Given the potential consequences of such an expression, I believe that this should usually be reserved for papers for which additional investigation is under way to resolve the issue. However, on occasion the evidence to resolve the question may not be available, such as when records are destroyed, which in itself may be considered misconduct. When portions of a manuscript are clearly in error, a partial retraction can be made. The obvious inference in such cases is that the remainder of the data and analysis are valid, although inaccuracies in one portion of a paper always raise suspicion about other data.

The action of the greatest gravity is a retraction or a formal withdrawal of a manuscript. Retraction may be caused by the post-publication discovery of errors by the authors, or by the publication of new findings, or the inability to reproduce the original results by other investigators. The retraction may be voluntary, or without permission of at least some of the authors. In such cases the editor, home institution, or at least one of the authors has determined that the paper’s findings are inaccurate, despite the fact that not all authors are in agreement with this conclusion. The rules of the National Library of Medicine (NLM) stipulate that a manuscript may be retracted by the editor, the sponsoring institution, or any one of the authors. The NLM does not distinguish manuscripts that are withdrawn due to honest mistakes from those that involve misconduct, a policy that I find regrettable. Interestingly, withdrawn manuscripts continue to be listed in MEDLINE, albeit with a notice of retraction, and evidence exists that they continue to be cited by other articles (5).

Given the gravity and consequences of manuscript retraction, it is obvious that this should not be undertaken lightly. A definition in that great medical resource, Wikipedia, states that a retraction of a published scientific article indicates that the data and conclusions of the original article should not be used as part of the foundation for future research, implying that the data is erroneous. Obviously this creates some interesting dilemmas. The misconduct of a given manuscript may involve not obtaining informed consent or not revealing clear conflicts of interest, while the fundamental data and conclusions are accurate. In such a case, retraction would not seem to be the best option. Similarly, the inability to produce all raw data due to loss or destruction of at least partial recordings is not clear evidence that the basic findings are inaccurate. Decisions in such cases are difficult, and are correct only in retrospect. Nevertheless, these are the circumstances in which editors, including those of this journal, can find themselves. As is our universal policy, in such cases the JACC editors convene as a group and reach a consensus decision.

Thankfully, we at JACC have not often found ourselves confronted with the issue of scientific misconduct. Our retractions have usually been initiated by the authors of the original article upon finding an honest error. In those cases where suspicions of misconduct have arisen, we have always asked the authors of the articles in question to respond, and usually give them the benefit of any doubt. However, if we can believe that over 10% of investigators are aware of scientific misconduct, either we as editors have been extraordinarily discerning of such transgressions during the review process, or we have occasionally been duped. This perhaps would not be surprising given the limited arsenal available to us to identify misconduct. In the final analysis, however, the validity of the medical literature has to be based upon the integrity of the community of investigators. Based upon my 35 years in academic medicine and research, I think that this confidence is reasonably well placed. I do not anticipate many retractions in JACC in the future.

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REFERENCES