

Correcting the Medical Literature: “To Err Is Human, to Correct Divine”

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Corrections are important to the integrity of the medical literature and clinical decision making. Those who use the content as a source for replication of findings or as the basis of new research rely on accurate data, which requires corrections of errors in published articles. These errors may range from relatively minor, inconsequential errors to major errors that invalidate the results and the underlying science (Table). Corrections of errors in published articles protect the reputation of authors, journals, and others involved in biomedical publication by demonstrating their willingness to publicly amend content in the best interests of science.

JAMA and the *JAMA Network* journals use numerous checks for quality from manuscript submission through publication, but errors still occur. Many errors originate with the content, inaccuracies that even astute peer reviewers, editors, and journal staff would not necessarily recognize (eg, a study participant improperly analyzed in the wrong treatment group). Reports of errors in published research reports originate from

myriad sources: readers, the original investigators while engaged in subsequent analyses, investigators trying to replicate the research, journal staff, and members of the news media. These sources are the most frequent discoverers of errors that are reported to the *JAMA Network* journals.

According to the International Committee of Medical Journal Editors, “corrections are needed for errors of fact” and “matters of debate are best handled as letters to the editor, as print or electronic correspondence, or as posts in a journal-sponsored online forum.”¹ The US National Library of Medicine has a useful guide for managing corrections to the literature and notes that it “does not differentiate between errors that originate in the publication process and those that result from errors of scientific logic or methodology.”² The Council of Science Editors has provided a list of questions to consider when a potential error is reported.³ Issues to consider include the nature of the error reported, the most appropriate method to correct the literature, and if any statute of limitations should

Table. *JAMA Network* Corrections, Pervasive Errors, and Retractions

| Type | Definition | Publication Response |
|---|--|--|
| Minor error | Inconsequential error (eg, typographical error that could result in misunderstanding) | Article corrected online: An indication of correction and date of correction are added to the article information (html and PDF versions). |
| Substantive errors | Errors requiring a Correction notice (eg, author name misspelled, incorrect numbers, important missing information) | Correction notice published: The article is corrected online with indication of correction and date of correction added to the article information (html and PDF versions). The Correction notice and corrected article are reciprocally linked. |
| Pervasive errors | Inadvertent errors that result in the need to correct important or numerous data in the abstract, text, tables, and figures (eg, a coding error) | <p>A. Letter and Correction: If none of the conclusions or interpretations are affected and there are no statistically significant changes in the results, a Letter of explanation from the authors and a Correction notice are published; the article is corrected online with indication of correction and date added to article information (html and PDF versions). The Letter, Correction notice, and corrected article are linked to each other.</p> <p>B. Retraction and Replacement: If the direction or significance of the results, interpretations, and conclusions change—and the science is still valid—a Letter of explanation from the authors is published as a Notice of Retraction and Replacement; the corrected article is replaced online with indication of correction and date added to article (html and PDF versions); a PDF copy of original article with the errors highlighted and a PDF copy of the replacement article with the corrections highlighted are published in an online supplement to the corrected, replaced article; the replacement article includes a prominent note: “This article has been retracted and replaced with a corrected version.” The Letter and replacement article are reciprocally linked.</p> <p>C. Retraction: If the results, interpretations, and conclusions change—and the science is no longer valid—a Notice of Retraction is published (see below).</p> |
| Scientific or research misconduct | Fabrication, falsification, or plagiarism | <p>A. Retraction: If confirmed, a Notice of Retraction as either a Letter from the authors or an Editorial from the editors is published. A prominent note and watermark are added to the retracted article (html and PDF versions): “This article has been retracted.” The Notice of Retraction and the retracted article are reciprocally linked.</p> <p>B. Expression of Concern: If not officially confirmed by the authors or authors’ institution or funders, but evidence of scientific or research misconduct is substantial, a Notice of Expression of Concern may be published as an Editorial from the editors. A prominent note is added to the html and the PDF versions of the article: “An Expression of Concern has been published about this article.” The Notice of Expression of Concern and the article of concern are reciprocally linked.</p> |
| or | or | |
| Pervasive errors that should not be corrected or replaced | Pervasive errors that invalidate the results, interpretations, conclusions, and the underlying science | |

apply. For the JAMA Network journals, most errors are reported relatively soon after publication. For potential corrections of older articles, the editors take into consideration the length of time since publication when determining whether a correction is warranted. However, age of the article alone is not a disqualifier for correction.

JAMA Network editors take seriously all reports of possible error. An investigation includes communication with the authors and examination of the documents, milestone dates, and metadata associated with the original submission, editing, and production of the article. The evaluation explores not only the what but the how—how did the error occur and what can be done to avoid recurrence? The investigation is important no matter how short the article or even if the error were only to occur in a footnote of an element of the article, such as in a table or figure. In addition, the editors are less interested in who caused the error unless it helps improve quality control or other processes or if the source is required for logical explanation of the correction to readers.

Regardless of the source of an error, JAMA Network journal editorial staff conduct a formal assessment and, when warranted, correct the error as quickly as possible. The PDF and digital versions of the original article are updated and reposted, along with a note stating what was corrected in the article with the date of correction. In most cases, and for all substantive errors, a Correction notice is published in the Letters section of the next available journal issue, and reciprocal links between the Correction notice and the corrected article are provided. On occasion, an error may be so serious (eg, error in drug dosage) or important to the author (eg, misspelling of an author's name) to warrant immediate correction online. In this case, it is made clear in the online article that a correction has been made, and a formal Correction notice follows. Or, an error may be deemed appropriate to correct online only (eg, a wording error or a production coding error that affects the display of an article) that does not warrant a formal Correction notice. In such cases, a note is added to the corrected online article that a correction has been made.

Just as Correction notices should not be used for matters of debate, they also should not be used for retraction of fraudu-

lent articles resulting from fabrication, falsification, or plagiarism. In those cases, and ordinarily after thorough investigation by the author's institutional authority or funder, a Retraction Notice is published as a Letter from the authors or an Editorial from the editors.⁴

However, articles with pervasive errors that cannot be managed with a simple Correction notice and Letter of explanation might be best managed with a Retraction and Replacement of the published article.⁵ For example, a pervasive error could result from a coding problem during data collection or a miscalculation that caused extensive inaccuracies throughout an article (eg, abstract, text, tables, and figures). Publication of pervasive errors that when corrected show a major change in the direction or significance of the originally published results, interpretations, and conclusions is a serious matter. However, if the errors were inadvertent and the underlying science is still considered reliable and important after subsequent review, the original article can be retracted and replaced. This can be done with a Letter of explanation from the authors that is published with the retracted and replaced article and an online supplement that contains a copy of the original article with the errors highlighted and a copy of the replaced article with the corrections highlighted.

Since 2015, the JAMA Network journals have permitted authors of a number of articles with such inadvertent pervasive errors to retract and replace their erroneous articles. Such replacement removes the stigma associated with serious but honest errors and allows readers to access and use the work in its replaced version without being stopped by a "Do Not Use" Retraction notice and Retraction watermark on the article.⁶ *The Lancet* has also used this process to retract and republish articles with inadvertent pervasive errors.⁷ The International Committee of Medical Journal Editors adopted a policy in support of this option in 2017.¹

The Table includes a list of types, definitions, and publication responses for errors, corrections, and retractions. While acknowledging that error is human, often inadvertent, and part of the natural course of science, we embrace corrections and think of them as positive contributions to the scholarly literature.

ARTICLE INFORMATION

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