

Publishing rigor: An extension of scientific rigor

Minding the business of scientific reporting

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Among the synonyms of rigor are thoroughness, accuracy, validity, precision, exactitude, conscientiousness, meticulousness, credibility, dependability, and confirmability. Scientists are trained to be meticulous in the collection of scientific data and to present their findings in an objective and truthful manner—usually in the form of describing the methods used and the results obtained. The peer review and editing processes, as extensions of the scientific process, should be equally meticulous as they represent an additional check on the validity of a scientific work.

What is *Neurology*® doing to maintain its publishing rigor? The editors and staff follow strict procedures to create a scientific publication of the highest quality.

- We request reviews from at least 2 peer reviewers (more, if specialist expertise is needed in particular areas), and these reviews are read and evaluated by the Editor-in-Chief and an Associate Editor before a final decision is made regarding the disposition of a manuscript.
- We require the use of EQUATOR standards and checklists for appropriate articles. These include CONSORT diagrams for randomized, controlled trials; STARD checklists for authors reporting studies of accuracy of diagnostic tests; QUORUM for authors reporting systematic reviews or meta-analyses of randomized trials; STROBE checklists for cohort, case-controlled, and cross-sectional studies and all observational studies; and the STREGA checklist for reporting of genetic association studies.
- Increasingly, we request reviews from statistician editors to check the validity of the statistical tests for the data—that is, the correct tests must be selected, and they must be correctly applied to the data.
- We require that all submissions represent original research—not published elsewhere—to ensure that the scientific literature contains only new work, whether it is initial work or contains confirmatory observations.
- We ensure that the wording used to describe work is original and does not violate copyright. To check duplication of wording (plagiarism or self-plagiarism), we use the software program iThenticate to check for overlap with other published articles and we request changes in wording and phrasing if duplication is found.¹ If overlap is extensive, we reject the article and educate the authors about our expectations.
- In cases of allegations of misconduct (including plagiarism and falsification or fabrication of data), we follow a process of gathering the facts, obtaining recommendations from our scientific integrity advisor, undertaking further investigation if necessary, and making a judgment based on the best information. Depending on the particular circumstances, findings of misconduct can result in loss of privileges to publish in the journal, reports to an author's institution or an organization responsible for research governance such as the Office of Research Integrity, and publication of notices of duplicate publication or plagiarism, errata, expressions of concern, or retractions.
- We value and promote transparency in authorship and declaration of conflicts of interest. To avoid ghost and guest authorship, we define an author as someone who has made a substantive intellectual contribution to the design or conceptualization of the study, or to analysis or interpretation of the data, or to drafting or revising the manuscript for intellectual content. In addition, professional writers employed by pharmaceutical companies or other academic, governmental, or commercial entities who have drafted or revised the intellectual content of the paper must be included as authors. On electronic forms, each author must list his or her contributions and make full disclosure of all potential conflicts of interest within the past 2 years or for the length of the study if the study lasted more than 2 years. All contributions and conflicts of interest are published.²
- In reporting studies, we require authors to indicate approvals by ethical standards committees,

From the American Academy of Neurology (P.K.B., R.A.G.), Minneapolis, MN; and Strong Epilepsy Center and University of Rochester Medical Center (R.A.G.), Rochester, NY.

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indicate procurement of patient consent to participate in studies, and provide patient consent-to-disclose forms for recognizable participants in photographs and videos. We require investigators to register their trials in public clinical trial registries.

- We try to avoid language that might give false impressions about the results, for example, citing a finding as a “trend” when the finding almost, but does not, reach significance. (It should be reported as “not different.”) Furthermore, we try to de-emphasize the results of secondary analyses if the primary analyses do not achieve significance or if the result has small effect size.
- A section of the *Neurology* Editorial Board assigns levels of evidence based on the (AAN) classification scheme requirement for papers reporting on clinical therapeutic intervention studies.
- The journal practices editorial independence, i.e., making decisions without interference from the AAN, the owner of the journal. Without influence by the journal owners, the editors are able to establish the credibility of the journal as an independent entity and best choose the content they believe meets the obligations of the journal to its readers and the scientific community as a whole.
- We hold annual editorial retreats to discuss the future of the journal and new initiatives we believe would benefit the journal in the face of challenges from new technologies, global changes in submission and readership, and changing business models. For example, recent retreats have resulted in the launches of our spin-off journals *Neurology*[®] *Clinical Practice* and *Neurology*[®] *Neuroimmunology & Neuroinflammation*.
- The editor and staff regularly attend meetings relating to issues in journal publishing to keep abreast of trends in the industry that could affect the journal’s mission and its publication policies. Dr. Gross has attended meetings with other editors regarding the poor reproducibility of preclinical studies and the need for more transparent reporting.³ He collaborates with a group that seeks to define better reporting standards.⁴ P. Baskin attends meetings, takes part in leadership, and is a frequent speaker for publishing

organizations such as HighWire Press, the Council of Science Editors (CSE), and the Society for Scholarly Publishing; she is currently Editor-in-Chief of CSE’s quarterly publication, *Science Editor*, and is currently vice president of CSE.

Scientific publishing is a human process and therefore is not perfect. Notwithstanding this limitation, we pledge to seek out and use best practices, impartiality, and integrity to provide the readers of *Neurology* journals with the highest quality content for their research and clinical practice.

AUTHOR CONTRIBUTIONS

P. Baskin and R. Gross drafted/revised the manuscript for content, including medical writing for content, and acquired the data.

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DISCLOSURE

Patricia K. Baskin is Executive Editor of the *Neurology* journals and employed by the American Academy of Neurology. Her spouse is employed by the Department of Veterans Affairs and University of Washington and receives research funding from the Department of Veterans Affairs and NIH. He is Executive Editor of the *Journal of Histochemistry and Cytochemistry* and receives a stipend for this activity. P. Baskin received reimbursement for travel expenses to 2 meetings in 2011 of The International Publication Planning Association (TIPPA), an association of industry professionals sponsored by Pharmaceutical Education Associates LLC., to present *Neurology*’s authorship policies, and consulted with no stipend or reimbursements for the Medical Publishing Insights and Practices initiative at journal-pharma workshops in 2011, 2012, and 2014 and 1 TIPPA meeting in 2012. She also receives an honorarium as Editor-in-Chief of *Science Editor*, the publication of the Council of Science Editors. R. Gross is supported for educational endeavors by the University of Rochester Medical Center’s Clinical and Translational Science Award from the NIH. Since his appointment as Editor-in-Chief in 2009, R. Gross has ceased participation in industry-sponsored clinical trials and speakers’ bureaus. He receives an honorarium from AAN as Editor-in-Chief of *Neurology*. Go to Neurology.org for full disclosures.

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