sible under the new standard for admissibility of scientific evidence, and thus affirmed the grant of summary judgment for the defendant (*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 43 F.3d 1311 (9th Cir. 1995)).

In 1993, the Supreme Court held that the Federal Rules of Evidence superseded the old *Frye* standard for admissibility of scientific evidence (*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786 (1993)). Under the *Frye* standard, scientific evidence was admissible if it was based on a scientific technique that was generally accepted by the scientific community (*Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923)). The Supreme Court in *Daubert* ruled that the *Frye* standard had been replaced in 1975 when the Federal Rules of Evidence were enacted, and that the current standard is that scientific evidence is admissible if it is both reliable and relevant. The Court held that to be reliable the testimony must be grounded in valid methods and principles of science; and to be relevant the testimony must assist the trier of fact in understanding the evidence or in determining a fact in issue.

The case was remanded to the Ninth Circuit to apply the new standard to the facts of *Daubert*. In *Daubert*, two minors brought suit against the drug manufacturer, alleging that their limb reduction birth defects resulted from their mother's ingestion of Bendectin, a drug made by the defendant and prescribed for pregnant women with morning sickness. The plaintiffs provided numerous experts to testify on their behalf, but the district court and the Ninth Circuit had found their testimony to be inadmissible under *Frye*'s "general acceptance" standard.

On remand from the Supreme Court, the Ninth Circuit laid out a framework for analysis under the new scientific evidence admissibility standard. The court delineated the two-part analysis as follows: first, the court must determine reliability, which involves deciding "nothing less than whether the experts' testimony reflects scientific knowledge, whether their findings are derived by the scientific method, and whether their work product amounts to good science"; and, second, the court "must ensure that the proposed expert testimony is relevant to the task at hand, i.e., that it logically advances a material aspect of the proposing party's case" (*Daubert*, 43 F.3d at 1315).

As to reliability, the Ninth Circuit stated that two principle methods can be used to show that the experts' findings are based on sound science and accepted methodologies. The first way is to show that the testimony is based on legitimate research conducted independently of the pending litigation. The second is to prove that the underlying research and analysis has been subjected to scientific scrutiny through peer review and/or publication. However, none of the expert witnesses for the *Daubert* plaintiffs based their testimony on research independent of the litigation, nor had any of them published any work or had their work subjected to review by colleagues so to assess their opinions about Bendectin and limb reduction birth defects. Even when reliability cannot be shown in either of these two ways, the court can deem the experts' testimony reliable if the experts show that they reached their conclusions through application of a valid scientific methodology; however, the court found no such showing in this case.

As to the issue of relevance, the fact at issue under California law was whether Bendectin was more likely than not the cause of the plaintiffs' injuries. Since none of the plaintiffs' experts (except one whom the court deemed clearly unreliable) was willing to testify that Bendectin more than doubled the likelihood of birth defects, the court deemed their testimony irrelevant. Thus, all of the plaintiffs' expert testimony was found inadmissible, and the grant of summary judgment was affirmed.

This case is significant because it provides a clear framework for analysis of the problem of admissibility of scientific evidence after the Supreme Court's landmark *Daubert* decision. The Ninth Circuit was clearly uncomfortable with its role of determining what is "good science," nonetheless, it was able to formulate useful guidelines for making the difficult determinations necessary under the new, more flexible standard governing the admissibility of scientific evidence.

L.S.R.

Letters to the Editor

To the Editor: A major dilemma exists when incorporating new medical information into clinical practice. The probable causes are multiple, and some are laid out in the article by Glass.[1] I have some problems with that article, however.

A concern is Glass's call for a standardized format for reporting clinical trials. Such recommendations have been made before, and the medical literature is replete with guidelines for the reporting of randomized clinical trials.[2]

An ethical problem exists with the advanced release of clinical trial data and conclusions prior to peer review and publication in medical journals. Clinical Alerts are distributed to the health community and are accessible through electronic means by anyone with a modem. Such dissemination and accessibility may constitute "prior publication," and that may be grounds for biomedical journal editors to refuse subsequent manuscripts for review and publication. The "Uniform Requirements for Manuscripts Submitted to Biomedical Journals"[3] states that reporting preliminary findings, presented at meetings or published in the form of abstracts (usually 250 to 300 words), does not preclude consideration of a subsequent manuscript.

However, publication of the presentation in the proceedings of the meeting, or as press reports embellished with illustrations, figures, and tables does preclude consideration, as does preliminary release of scientific information to the media from a manuscript that has been accepted for publication but not yet published. Because Clinical Alerts are widely accessible, publication of the complete data and conclusions may well be a breach of the "Requirements."

https://doi.org/10.1111/j.1748-720X.1995.tb01354.x Published online by Cambridge University Press

Similarly, multiple publication of the same study is not considered ethical scientific conduct. The early publication of complete data sets in a Clinical Alert with subsequent publication of the manuscript, as suggested by Glass, may result in the unethical behavior of multiple publications.

More seriously, however, is the publication of data and conclusions without adequate external peer review. This has occurred, and the lesson should have been learned.[4] Delays of proper review should not be seen as an obstruction, but as a necessary protective step for the authors, readers, and patients. Journals usually have an expedited review process for handling evaluation of studies that truly may have a major impact on health care.

Clinical Alerts strive to report succinctly the data and conclusions of medical studies. This may not allow for discussion of the many nuances of the controversies that permeate medical practice. External peer review should lead to more complete and objective data presentation, to balanced data interpretation, and to ranking of investigators' conclusions relative to existing medical findings.

Also a significant error is found on page 329, which erroneously describes the patient population under study. The patients studied had "congestive heart failure" not "congenital heart failure."

In summary, accurate and complete reporting of clinical studies is essential. External peer review plays an important role in assuring such reporting. The perceived need for haste in publishing the results of potentially landmark clinical trials should not undermine the process of scientific review, nor should it place investigators and sponsors in the unethical position of submitting multiple manuscripts.

Ellen D. Burgess, M.D.
Div. Of Renal Medicine
University of Calgary
Calgary, Alberta

References

1. K.C. Glass, "Toward a Duty to Report Clinical Trials Accurately: The Clinical Alert and Beyond," *J. L. Med. & Ethics*, 22 (1994): 327–38.

2. Standards of Reporting Trials Group, "A Proposal for Structured Reporting of Randomized Control Trials," *JAMA*, 272 (1994): 1926–31.

3. International Committee of Medical Journal Editors, "Uniform Requirements for Manuscripts Submitted to Biomedical Journals," *N. Engl. J. Med.*, 324 (1991): 424–28.

4. A. Yankauer, "Prior Publication, An Ethical Issue," *Am. J. Pub. Health*, 75 (1985): 341–43.

Reply to Dr. Ellen Burgess. Dr. Burgess claims that implementing my recommendations concerning Clinical Alerts would violate restrictions imposed by biomedical journals on prior publication. The need for exceptions to the so-called "Inglefinger Rule" have long been recognized by journals when immediate dissemination of information is required as a matter of great importance to the public health.[1] Editors of *The New England Journal of Medicine* and *JAMA* have stated that prepublication release of medical results would not jeopardize publication in their journals, if the appropriate authorities had decided that the need for knowledge of these results is too urgent to wait for publication in medical journals.[2]

The Clinical Alert is a wholly new reporting mechanism, representing an exception to previously existing means of disseminating trial results. It was intended, according to one of its creators, "to bring new information to the attention of clinicians, in order to reduce the interval between identifying an effective therapy and widespread adoption of that therapy."[3] Clinical Alerts have been specifically recognized as an exception to the "Inglefinger Rule."[4]

If the Clinical Alert is meant to furnish clinicians with information immediately relevant to patient care, it must contain material sufficient to provide the basis for a clinical judgment. My article does *not* call for "early publication of complete data sets in a Clinical Alert," as Dr. Burgess states in her letter. I do suggest, however, that reporting standards could be instituted mandating the inclusion of "all information required to make a clinical judgment." When this is *not* feasible, I recommend that "*at the very least*" an Alert ought to include a clear statement that readers should refer to the complete journal article on publication before forming a clinical judgment on its applicability to any patient.

Kathleen Cranley Glass, D.C.L.
Dept. of Human Genetics and
Ctr. for Medicine, Ethics and Law
McGill University
Montreal, Quebec

References

1. A.S. Relman, "More on the Inglefinger Rule," *N. Engl. J. Med.*, 318 (1988): at 1125; G.D. Lundberg, R.M. Glass, and L.E. Joyce, "Policy of AMA Journals Regarding Release of Information to the Public," *JAMA*, 265 (1991): at 400; and S.W. Fletcher and R.H. Fletcher, "Early Release of Research Results," *Ann. Int. Med.*, 114 (1991): 698–700.

2. See *supra* note 1.

3. M.A. Friedman, "The Clinical Announcement Policy of the National Cancer Institute," in C.J. Williams, ed., *Introducing New Treatments for Cancer: Practical, Ethical and Legal Problems* (Chichester: John Wiley, 1992): at 414.

4. See Fletcher and Fletcher, *supra* note 1.

HEALTHCARE ETHICS FORUM '95
SEPTEMBER 10, 1995
SAN FRANCISCO

Don't wait, Call AACN at 800-899-2226 or 714-362-2050 ext. 595 for a free detailed brochure. FAX-On-Demand at 800-AACN-FAX.

https://doi.org/10.1111/j.1748-720X.1995.tb01354.x Published online by Cambridge University Press