Over the years I have attended numerous symposia where the merits and pitfalls of peer review were relentlessly probed. Peer review is the process of an author’s manuscript undergoing the scrutiny of others who are, ostensibly, experts in the domain of the author. In a recent study of peer review, respondents overwhelmingly supported it, indicating that it greatly assists scientific communication, asserting that without it, there would be no control over the dissemination of valid and reliable information.1

Consider the mission statement of the AANA Journal, one that while straightforward is lofty:

The AANA Journal is the official scholarly journal of the AANA, publishing original manuscripts that foster our understanding of the science of anesthesia delivery and investigate issues, ideas, and innovations that advance the practice of nurse anesthesia.

This mission statement is congruent with that of the AANA, which is "AANA advances patient safety, practice excellence, and its members’ profession." Peer review is a critical step in the process of achieving these mission statements. What constitutes peer review?

Having had papers “rejected” or simply dismissed as “drivel” from a variety of journals over the years, my view of peer review comes from both sides of the looking glass. Imagine if you will, a time in the early 1600s when many authoritative thinkers reacted to Galileo’s thesis that the sun (and not the earth) resided at the center of the solar system. This view proved untenable to both the extant scientific community (his peers), as well as to theologians and resulted in his incarceration and censure as a result of the Inquisition. This illustration of peer review may seem a bit draconian, but nonetheless represents the process gone bad, given that we now embrace, not as theory but as law, the heliocentric nature of our solar system.

Examples for Consideration

Earlier this year, the prestigious Journal of Personality and Social Psychology published work that extrasensory perception (ESP) was operative in a group of volunteers in their ability to predict future events.2 The backlash that resulted was predictably severe, perhaps akin to what might happen if the AANA Journal published work suggesting that we could resuscitate cardiac arrest due to inhalational agent overdose with prayer alone. How could peer review have allowed this to pass muster? Especially when 8 of the 10 tests applied did not reveal ESP influence; one test demonstrated borderline effect and another test appeared to be favorable of ESP influence. Subsequent analysis revealed that even favorable influence could be explained by random chance effect.

Consider the saga of Dr Scott Reuben, an anesthesiologist and researcher, who participated in research misconduct of the worst kind: data fabrication that ultimately exposed tens of thousands of patients to unproven drug regimens, resulting in the retraction of some two dozen papers and his imprisonment. How could the peer review process have allowed this to happen? Is this something the peer reviewers of the journals in which Reuben published should have detected? I think not. Those serving in the capacity as peer reviewers cannot be there when data are collected or analyzed. Science, in no small part, is dependent on the integrity of those who present it. Peer review can hardly, unless major red flags appear, detect the
sociopathic or otherwise maligned researcher.

The Peer Review Process
Having been keenly involved with peer review oversight at the AANA Journal for more than 2 decades, I believe very strongly that scholarly literature can be reduced to 4 primary functions:

1. Dissemination of current knowledge that informs practice and stimulates discovery
2. Archiving of the fundamental knowledge base of our profession
3. Data control of published information by a process of rigorous ongoing critique
4. Attribution of credit to the work of the architects of that knowledge—the authors

Peer review as most view it constitutes a set of assigned reviewers (in the case of AANA Journal submissions, 3 to 4 peers with knowledge of the domain) who assiduously critique work submitted for consideration for publication. These submissions, after being vetted by me (the filter at this point is not a fine one—mainly searching for broad criteria such as “scope is of interest to our readers,” “institutional review board approval is noted if applicable,” and “egregious violations of clinical practice and science”) are then forwarded to carefully selected reviewers who may or may not be formally associated with the AANA Journal. Ideally those reviewers have a personal record of scholarship, acumen and experience in the domain(s) of the submitted work, but sometimes even those with limited expertise may be asked to critique the paper to help ensure what I term “readability titer”—that is, will this all make sense and be clear to the average reader?

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While the process of peer review is widely considered to maintain the overall quality of the scholarly literature, there is some disagreement on what type of review process should occur. It is essential that a scholarly journal needs an editor in chief, but a journal must not be managed or a paper accepted or rejected based on the views of a single czar-like entity. Rather, journals embrace one of the following forms of team peer review:

• Single-blind: author’s identity is known to the reviewers; reviewers’ identity is hidden to the author.
• Double-blind: identities of the author and reviewers are hidden from each other.
• Open: author’s and reviewers’ identities are known to each other.

Constructive and logical arguments are proffered for each of these approaches that are beyond the scope of this brief paper. The AANA Journal has long embraced the “double-blind” model that, although not perfect, provides the best chance for authors and reviewers alike to focus on content and remain unaffected by both conscious and unconscious bias—bias being the plague of the scholarly dissemination process.

Proven Methodology
In 1987, I penned an editorial noting that science only works if scientists do not behave the way that people normally do. It follows that when we engage in science (research) or publishing (writing), our approach must be to employ a proven methodology, one free from human bias and imperfection. Our volunteer reviewers encounter papers at a very early stage. In a process akin to that of a structural engineer, they help ensure that only work with merit goes on to survive as published manuscripts. AANA Journal peer reviewers are the scientific gatekeepers of our profession.

A decade after that editorial I wondered, along with my friend and colleague, John Aker, CRNA, DNAP, currently at the University of Iowa, if our peer review system was working. Applying rigorous scientific and (for its time) advanced computer logic analysis, we found that over the course of the submission, revision, and publication process, peer review resulted in significant improvement in readability and utility of papers submitted to the AANA Journal. This observation awaits further validation from our current generation of newly minted scholars.

Concluding Remarks
Peer review is not a new phenomenon. While many centuries in its execution, it certainly became formalized more than 200 years ago. To this day, peer review serves to filter out incorrect and inadequate information and, in that process, it improves accuracy, validity and readability. The fundamental purpose of peer review is quality control with the ongoing process of facilitating the introduction of information into our discipline that improves the care of patients who require anesthesia services. Occasionally it fails, but when it works it facilitates information dissemination, informs practice, stimulates discussion, prompts additional research, and provides a tangible metric to the quality of the profession.

See who the reviewers are by visiting the masthead published in the AANA Journal. Understand that they are volunteers who serve as gatekeepers, virtually always without tangible reward except knowing that what they do is meaningful to us all as it advances our professional evolution.

REFERENCES

AUTHOR
Chuck Biddle, CRNA, PhD, is a professor and staff anesthetist at Virginia Commonwealth University, Richmond, Virginia. He is editor in chief of the AANA Journal. Email: cbiddle@hsc.vcu.edu.