

Trust—but Verify—Scientific Findings

The world of implant dentistry has changed dramatically over the past 20 years. Those of us whose birthdays are marked on a pre-1960 calendar have watched implant dentistry grow from a smattering of pioneering dentists with a primary goal of helping patients acquire the ability to function with comfort and confidence to a prosperous discipline with a global implant and prosthetic market that exceeded \$6 billion in 2013.¹ The vast expansion of implant dentistry has been driven by clinical and scientific research, from which both clinicians and patients have benefitted greatly. For the most part, research has gotten it right. However, the drive for being first to market and having the most cutting-edge results can lead to the detriment of the profession and the patients we care for.

The practices of medicine and science are beginning to ask, “Is the professional community doing ‘too much trusting and not enough verifying’ of published scientific findings?”² A plethora of findings published in medical (including dental) and scientific journals is the result of poorly designed experiments with inadequate controls or improper statistical analysis.³ In 2013, researchers at the biotech firm Amgen were able to replicate just 6 of 53 “breakthrough” studies in cancer research. Similarly, scientists at the pharmaceutical company Bayer were only able to repeat the results claimed in 25% of 67 critical papers studied. From 2000 to 2010, approximately 80 000 patients participated in clinical trials based on research that was later rescinded because of errors or indecorums.²

The number of scientists has grown exponentially, from a few hundred thousand in the 1950s to over 7 million today. Competition for research jobs is at an all-time high. Academic positions are dependent upon the “publish or perish” tenet. A scientist’s career advancement is not achieved by replicating others’ results, but rather by publishing groundbreaking conclusions. This “go big or go home” mentality promotes the overstatement of results and improper conclusions at the expense of quality control and validation. Without verification, false or falsified findings become doctrine and can lead to clinical disasters.

To preserve integrity, many journals implement high manuscript rejection rates. Manuscripts with the most striking findings have the greatest chance of making it to press, but in reality it should be the manuscript with conclusive results based on logical clinical design and sound science that succeeds in getting published. Sadly, “negative results” account for only

14% of published papers, down from 30% in 1990.² *Journal of Oral Implantology (JOI)* rarely receives a manuscript that invalidates previously published research with negative results. Knowing what is “not true” is as important to implant dentistry as knowing what is “true”.

The revered process of peer review is not perfect. A prominent medical journal informed experts in the field that they were being tested for peer review and deliberately incorporated errors into the assigned manuscript. The majority of the reviewers failed to recognize the errors and gave passes to the manuscript.

How does *JOI* hope to improve upon this admittedly murky situation? The answer lies (in part) with the readers. *JOI* encourages its readers to write Letters to the Editor voicing their opinions on the papers it publishes. The letters, which should offer sound clinical and scientific comments backed by sufficient supporting references, can either validate the original work or offer constructive criticism(s). The editors of *JOI* are hoping to receive a “postpublication peer review” with these letters, which should include a title for referencing in PubMed and avoid being “Dear Abby” in nature. Rejuvenating our peer review process by getting back to basics and critically reviewing our published literature will result in more reliable findings, and ultimately, better patient care. I look forward to receiving your constructive comments.

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