

Lean Product Development and Publish Ahead of Print

For decades now, businesses and other organizations have sought to improve the quality and efficiency of their products or services based on the Toyota Production System (TPS) to produce automobiles more quickly, at lower cost, and with higher safety profiles. In 2007, Teresko noted that Toyota's innovation was driven by the company's "commitment to 'the importance of appropriately integrating people, processes, tools, and technology to add value to the customer and society,'" in the words of the authors of a book on TPS.¹ At that time, Teresko emphasized that successful companies had learned that "less of [their] edge now comes from TPS and more comes from adopting lean product development practice" in combination with "dedication to continuous improvement." In dental education, academic dental institutions have used these processes to improve management of the dental clinic and to streamline overall dental school operations.^{2,3} Introduction of lean product development in all these areas has been greatly facilitated by innovations of the digital age.

For all the differences between producing an automobile or an efficient dental clinic and producing an academic journal, the world of publishing including the *Journal of Dental Education* (JDE) has also seen revolutionary changes as a result of technological innovations. From the first issue of the JDE published in 1936 until 2004, although computers had revolutionized the production process, the journal was available only in print issues. When the journal added online publication that year, access to its content expanded significantly. With online publication, readers' and authors' ability to read articles in the archive, conduct targeted searches, and track downloads of articles became possible, now greatly expanded with our upgraded website introduced in March 2018, which also gave all members of the American Dental Education Association (ADEA) direct access to the journal in a single sign-on process.

Some JDE authors can probably remember writing manuscripts on typewriters and submitting them to the Editor on paper. Tracking of submissions

and peer review were also then handled on paper, dependent on mailing hard copies through the U.S. Postal Service. Over time, computers and email increased the efficiency of creating, revising, and submitting manuscripts, and in 2009, the JDE moved to a fully online system (ScholarOne) for submission and peer review.

Over the last six years, in my time as Editor, we have adopted many best practices to improve the processing and publishing time for authors. Using the capabilities of ScholarOne and adopting a new commitment to timeliness, the JDE editors and staff now process submitted manuscripts efficiently and reliably. As a result, over the last five years, the average time from submission to first decision went from 28.3 days in 2012 to 21.2 in 2017.^{4,5} The average days from first submission to final decision decreased from 45.3 in 2012 to 33.5 in 2017. After clearing up a backlog of accepted articles early in my tenure, the average time to publish a manuscript after acceptance has gone from approximately 18 months in 2012 to six to seven months in 2018.

Now we are excited to announce another new development for the JDE: the introduction of Publish Ahead of Print (PAP), in which articles are published online ahead of their publication in an issue. This practice, made possible by online publishing, was begun by medical journals to make research findings available soon after an article is accepted, rather than waiting for an upcoming issue. Journals that provide this service publish their PAP articles in a variety of formats, from unedited accepted manuscript to edited manuscript to edited and designed proof.

At the JDE, we made the decision that PAP articles will be the final versions: edited, designed, proofread, and checked by their authors and staff. Publishing them in that form provides superior quality control and is efficient since all work on individual articles will be done up front, making the "assembly" of each issue a straightforward process. Currently, we have around 55 accepted articles in the pipeline for publication in the February through

June issues. Most of those articles will be published online from January through March; authors of those PAP articles can expect to receive proofs for review during that period. After that, the journal will move to a simultaneous dual-track editing and production schedule: 1) one track is a rolling process, in which new articles are published online around six to eight weeks after their acceptance, in two PAP batches per month; and 2) the other track is a just-in-time production process, in which the issues are assembled each month from the assigned PAP articles plus other materials (editorials, ads, etc.).

Like Toyota's leaders, we at the JDE are dedicated to continuous quality improvement by "integrating people, processes, tools, and technology to add value to the customer and society"—in our case, to readers, authors, and dental education. Introducing PAP will be our latest contribution to that continuing goal.

—Nadeem Y. Karimbux, DMD, MMSc

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