The Changing Structure of Industry-Sponsored Clinical Research: Pioneering Data Sharing and Transparency

Secular trends in medical knowledge generation, information dissemination, and shared medical decision making will substantially alter the structure of industry-sponsored clinical research—all for the better. These trends include democratization of medical information and movement away from a paternalistic health care model. Both challenge legacy behaviors in industry research (where clinical data are typically sequestered and intended solely for internal company, regulatory body, and medical publication uses) and in product marketing to physician providers and patient consumers. The thriving interest in open science and the inevitable widespread adoption of data sharing will be the centerpieces of this positive disruption (1).

Concerns of specious multiplicity of secondary data analyses, groundless litigation (2), exposure of confidential information for industry (3), and the desire for proprietary access to data in academia (3, 4) hinder the potential to improve public health and augment patient safety by sharing and pooling data sets resident in medical industry, academia, and regulatory authorities (5), including neutral and negative studies that go unpublished (6, 7).

Aware of these concerns, Medtronic (Minneapolis, Minnesota) partnered with the Yale University Open Data Access (YODA) program 2 years ago to gain objective analyses of the totality of data for 1 of our products, INFUSE (bone morphogenetic protein-2), which was approved by the U.S. Food and Drug Administration and available since 2002. In this approach, we transferred all patient-level data in our possession to YODA, from completed randomized trials and nonrandomized studies and all regulatory adverse event reports for YODA-directed systematic reviews that were done through 2 independent academic systematic review centers. Summary reports of these reviews, which were not available to the company before publication, appear in this issue (8, 9). In addition, we further committed to open access of these data sets to the public. To learn how to apply to access the data, visit http://medicine.yale.edu/core/projects/yodap.

I see Medtronic’s interest in pioneering open access of industry-sponsored research at the raw, individual-patient data level as being centered on a commitment to explore objective evaluation processes of Medtronic products. Such open analyses may or may not reinforce the company’s own evaluations and conclusions but would provide an opportunity for open discussion and exchange of perspectives. All stakeholders should benefit from a transparent process that produces reliable information about the benefits and harms of the products being studied. In particular, our industry should learn from such evaluations, which were derived collectively from the broad group of stakeholders, to better direct marketing activities to targeted markets where benefits of products are collectively believed to outweigh the harms. Moreover, open access should help to create a shared and informed profile of the performance and risk characteristics of products in the market so that surveillance metrics may be sharpened against realistic expectations for proper warnings or recall actions.

The experience to date with the YODA Bone Morphogenetic Protein-2 program has been illuminating, demonstrating the potential additive value of external dispassionate researchers examining the totality of product data. Although the provision of de-identified patient-level data was resource-intensive on our part, we placed our faith in the governance, data stewardship, operations, and choice of systematic reviewers in the YODA team. In addition, we have had substantive interactions with the YODA-elected independent steering committee about insights into broad perspectives on data ownership, data sharing, and distribution processes among researchers, as well as public dissemination of the data.

Over the past 2 years, this project has developed an ambitious, advanced approach to open access of clinical data that could benefit all stakeholders, regardless of their potential divergent perspectives. My view is that we will move away from the paradigm in which a single research entity, such as industry or academia, exclusively possesses and analyzes the data from a clinical study to arrive at a singular set of conclusions and interpretations about the benefits and harms of a medical intervention. Although the present paradigm offers some consistency in analytic method and interpretation through built-in checks and balances for publication (peer review) or product approval (regulatory body review) and the expected good intentions of researchers to find the truth about the benefits and harms of products, different interpretations may arise from different stakeholders if they have access to the raw data. The reasons for the differences include wide-ranging values, preferences, and social perspectives; variability in analytic competency, capacity, and method; and the level of completeness of the data evaluated.

An ideal open-access framework that engages relevant stakeholders would provide a more balanced and reliable conclusion and interpretation of the data about a medical product compared with the existing paradigm of an individual stakeholder’s analysis and interpretation. This open-access paradigm does require, however, a rigorous framework and feasible and effective process stages. First, there should be open access to all of the patient-level data from any given clinical data set of interest for all relevant stakeholders (10) under a usable data framework, such as the Integrating Data for Analysis, Anonymization, and Sharing.
model. After this data distribution, one would not be surprised to find either consistent or divergent conclusions and interpretations of the data based on the variable factors affecting the derivation of conclusions previously described. Second, there must be an agreed-on, convergent, or standardized set of data and analytic methods similar to the Clinical Data Interchange Standards Consortium or Health Level Seven standards to which stakeholders must comply so that their analyses may be shared. Third, there must be a public forum in which healthy discussion can occur, focused on adherence to analytic standards. Fourth, there must be a willingness and fervor to further iterate data analysis when the open discussion stage uncovers rational arguments that demand corrective actions. Adherence to this or a similar open framework with rigorous processes is critical to achieve the best possible convergence of the conclusions and interpretations (1).

This open access and iterative consensus process will not provide the seemingly immediate inferences about a medical product that we have been accustomed to getting from individual stakeholder analyses, but it will likely provide the more balanced and reliable inferences that would most benefit patients and society. The key to open access that may lead to such reliable conclusions is not the generation of divergent conclusions per se but the open discussion and exchange of information (under common, accepted analytic standards) and the willingness to revise conclusions when necessary. The value to medical industry is the potential for attaining collective agreement on the benefits and harms of medical products among relevant stakeholders. Thus, the targeted markets may be sharpened to those segments where there is broad stakeholder agreement of the benefit over harm of a product, leading to more focused and expected market adoption.

As shown by Medtronic’s initiation, support, and endorsement of this open-access approach with YODA, we intend to continue to advance our principles and leadership in pioneering new models of clinical research, data sharing, and transparency.

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Disclaimer: The author is an employee of Medtronic and serves as a member of the Board of Governors for the Patient Centered Outcomes Research Institute. The views expressed are not necessarily the views of Medtronic or the Patient Centered Outcomes Research Institute.

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References