

POLICY

From passengers to co-pilots: Patient roles expand

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The premier position of medical research on the U.S. national policy agenda offers an unprecedented opportunity to advance the science of patient input and marks a turning point in the evolution of patient engagement.

For most of history, patients have been the passive recipients of medical care with little or no role in research. Even as research subjects, patients were not required to give informed consent prior to adoption of the Nuremberg Code in 1947. Since then, patient participation has expanded dramatically, and today, opportunities abound to serve as active partners in defining and prioritizing research questions and solutions. As digital strategist Leonard Kish declared in 2012, “If patient engagement were a drug, it would be the blockbuster drug of the century and malpractice not to use it” (1).

Patient engagement offers the promise of advancing more personal and efficacious medical products faster than the typical ~15-year discovery-to-market timeline (2). Here, we explore the early foundations of patient engagement (table S1), where it occurs in the drug-development pipeline, the power of recent policy initiatives, and prospects for success in improving health outcomes.

FROM SIDELINES TO CENTER COURT

Early in the last century, patients began to mobilize to accelerate research for particular conditions. The March of Dimes, founded by President Franklin D. Roosevelt in 1938 to expand polio research, is one of the first examples of philanthropy

directed at finding treatments and cures. Research supported by individuals through the March of Dimes led to development of the “iron lung” and a successful vaccine. Until recently, this case was an outlier, considering that until the 1973 Patient Bill of Rights was adopted by the American Hospital Association, patients did not necessarily expect to be told their diagnosis, much less have a voice in determining their care plan.



Addressing a patient's part in advancing biomedicine.

Even in recent years, patients didn't always express their own preferences and expectations for care, deferring to choices the doctor deemed best.

The HIV/AIDS movement catapulted patient needs to the forefront of research

and created the force for change that dramatically altered regulatory approval processes at the U.S. Food and Drug Administration (FDA), funding formulas and emphasis at the U.S. National Institutes of Health (NIH), and the path forward for disease organizations. People affected by HIV rallied together and created a movement that demanded change and got results (3): from the creation of Gay Men's Health Crisis in New York in 1982 and the AIDS Coalition to Unleash Power in 1987, to the National Institute of Allergy and Infectious Diseases' (NIAID's) formation of the largest HIV clinical trials network in the world, to protests at both NIH and FDA, to passage of the Ryan White Comprehensive AIDS Resources Emergency Act in 1990.

The HIV/AIDS model continues to provide a roadmap followed by other patient communities, demonstrating that it is not enough to question the status quo; you have

to do the hard work of presenting well-founded alternatives. As Anthony Fauci, director of NIAID, noted at a *FasterCures* event in 2011, “If you really want to shake cages you have to be persistent. This is very different than coming to a meeting once a year. We knew the HIV/AIDS activists weren't going away.”

Today, the role of patients as partners permeates the R&D landscape, extending far beyond the traditional model of funding basic science through donations. Spurred on by the increase of entrepreneurial philanthropy and the proliferation of technology that connects and empowers patient communities, patient influence on decision-making is increasing. In particular, the venture philanthropy drug-development model pioneered by the Cystic Fibrosis Foundation—

which led to the codevelopment, with Vertex Pharmaceuticals, of Kalydeco, the first disease-modifying treatment aimed at the genetic cause of cystic fibrosis—is gaining steam and altering the landscape of disease research and cross-sector collaboration.

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The U.S. federal government recently initiated a series of efforts to more formally incorporate patient input into its decision-making processes. Efforts and entities have jumpstarted activities across the medical products industry to elicit and include patient perspectives along the full range of clinical development, such as the Patient-Centered Outcomes Research Institute (PCORI), established through the Affordable Care Act in 2010; the Patient-Focused Drug Development initiative at the FDA, mandated under the fifth reauthorization of the Prescription Drug User Fee Act (PDUFA) in 2012; and a Patient Preference Initiative launched by the FDA's Center for Devices and Radiologic Health (CDRH) in 2013.

POLICY PROSPECTS CONVERGE

The past year has ushered in a “perfect storm” of policy initiatives in biomedical research and opportunities for patient engagement. In April 2014, the chairman of the U.S. House of Representatives Energy and Commerce Committee, Fred Upton, partnered with Rep. Diana DeGette to launch the 21st Century Cures Initiative with a series of hearings and roundtable discussions around the country. These listening sessions solicited unprecedented public input about how Congress could help “accelerate the discovery, development, and delivery of promising new therapies and cures for patients and maintain our nation’s standing as the biomedical-innovation capital of the world” (4). In recognition of the committee’s patient-centered emphasis, Title 1 of the first draft of proposals—released on 27 January 2015—was titled “Putting patients first by incorporating their perspectives into the regulatory process and addressing unmet medical needs” (5). The proposals also include patient representatives in nearly every council, panel, advisory board, and body that would be created under the act.

Two days later, a companion effort was announced in the U.S. Senate under the Health, Education, Labor, and Pensions Committee entitled “Innovation for healthier Americans: Identifying opportunities for meaningful reform to our nation’s medical product discovery and development” (6). It highlighted disease registries sponsored by nonprofit organizations as a “way for patients with a specific disease to signal their potential willingness to participate in research on that disease” and public-private partnerships as a means to “bring academia, government, patients, industry, and others together to

solve complex scientific and process questions about medical product development.”

The next day, the executive branch added its voice to the chorus when U.S. President Barack Obama announced the Precision Medicine Initiative, a “moon shot” type project that includes the building of a cohort of 1 million engaged participants to contribute data and insights over many years, enabling researchers to better understand how genomic variations and other health factors affect disease development. The president’s invitation outlined a collaborative approach to identifying superior treatments and prevention strategies: “In order for us to realize [the Initiative’s] potential, I’m asking more hospitals and researchers and privacy experts to join us in this effort. I’m asking entrepreneurs and nonprofits to help us create tools that give patients the chance to get involved as well. Because we want every American ultimately to be able to securely access and analyze their own health data, so that they can make the best decisions for themselves and for their families.”

Negotiations for the sixth authorization of PDUFA will begin this fall among the FDA, Congress, and the biopharmaceutical industry. For the second time, patient representatives will have an active role in the process, although not quite full negotiating status, because user fees are paid by industry to FDA with oversight from Congress. Most recognize that patients’ influence and the open dialogue among stakeholders under the 21st Century Cures initiative has served as a dress rehearsal—in particular, these new actors are given opportunities to contribute to the hashing out of ideas, alignment of goals, and vetting of approaches to meeting those goals.

For example, *FasterCures*, the Biotechnology Industry Organization, and Eli Lilly & Co. developed independent yet complementary proposals for Congress as part of 21st Century Cures to authorize a public-private partnership dedicated to developing tools and methods to support science-based approaches for collecting patient input. The bipartisan discussion draft includes such a body, the “Council for 21st Century Cures,” whose mandate is to “accelerate the discovery, development, and delivery in the United States of innovative cures, treatments, and preventive measures for patients” (7).

THE SCIENCE OF PATIENT INPUT

Accompanying acceptance of the need to integrate patient perspectives is an increase in the demand for research-based methods

and tools to measure the effectiveness of incorporating patient input into the system and, ultimately, its impact on patient health. What began as an extension of patient advocacy has evolved into an emerging scientific discipline aimed at understanding and incorporating patient needs into the processes of developing, regulating, and delivering new therapies.

A compelling “call to action” authored by thought leaders from international patient organizations and pharmaceutical companies describes the gap that must be closed: “Despite the increasing number and scope of patient-involvement initiatives, there is no accepted master framework for systematic patient involvement in industry-led medicines research and development, regulatory review, or market access decisions.... It is essential that all stakeholders participate to drive adoption and implementation of the framework and to ensure that patients and their needs are embedded at the heart of medicines development and lifecycle management” (8). Meetings convened in the first quarter of 2015 by the Clinical Trials Transformation Initiative, National Health Council, University of Maryland’s Center of Excellence for Regulatory Science Innovation, and PCORI have provided opportunities to share emerging practices and lessons learned.

For medical devices and biologics, the call to action was answered by the FDA’s CDRH and Center for Biologics Evaluation and Research on 13 May 2015, with a draft guidance entitled “Patient preference information—Submission, review in PMAs, HDE applications, and de novo requests, and inclusion in device labeling” (9). The guidance outlines “qualities” of patient-preference information acceptable for regulatory purposes and directions for submitting such data to the agency. On the same date, the Medical Device Innovation Consortium (MDIC), a public-private partnership, released its “Framework and catalog of methods for incorporating information on patient preferences regarding benefit and risk into the regulatory assessments of new medical technologies” (10). The catalog captures methods of assessing patient preference that are adapted from health economics, outcomes research, epidemiology, social sciences, and marketing sciences. Although compiled for medical technology development, the catalog is expected to be highly transferable to the development of pharmaceuticals and biologics as well.

For drugs, the groundwork has been laid by researchers who participated in early organized efforts to develop structured assessment of benefits and risks, including the Benefit-Risk Assessment Team convened by the Pharmaceutical Research and Manufacturers of America, the Centre for Innovation in Regulatory Sciences, and special interest groups within the International Society for Pharmacoeconomics and Outcomes Research. *FasterCures's* Benefit-Risk Advisory Council comprises many of these experts along with patient leaders and provided the faculty for a one-day “benefit-risk boot camp” on this topic in September 2014.

On a parallel track, patient organizations have piloted new approaches to meet the demand for data that supplement personal testimony and participation of individual advocates as patient representatives in decision-making bodies. Parent Project Muscular Dystrophy (PPMD) demonstrated leadership in sponsoring a benefit-risk-preference study among parents of boys with the rare but fatal form of muscular dystrophy known as Duchenne. PPMD published the results, held a policy forum that attracted 17 FDA officials, and organized a community-based drafting of a regulatory guidance for drug development. The FDA opened a public docket to receive comments on PPMD’s guidance document and is expected to issue its version in coming weeks. Other patient organizations are following PPMD’s model—seeking academic partners, building patient registries, and educating their patient communities about new opportunities to reshape treatment pipelines and care delivery.

ACCOUNTABILITY ALL AROUND

To fulfill the prediction that patient engagement will be the blockbuster drug of the century, we offer five observations to guide the path forward:

- There is a need to expand the capacity of all participants—industry, academia, government, and patient organizations—to engage patients in biomedical research, medical product development, regulatory decision-making, and health care delivery. We must

understand the full range of patient experiences and expectations across a representative cross section of individuals with a particular diagnosis or collection of conditions.

- Developing appropriate, scalable, sustainable methods and practices will require collaboration, experimentation, coordination, and transparency. Multiple types of expertise will be needed, and adoption will be highly iterative and require extreme focus on the goal: improved patient outcomes.

- It’s too early to tout emerging practices as being “best,” and standards are likely to change rapidly. This may challenge resources and introduce new sources of uncertainty, especially at first. We may all need to tolerate more turbulence in the ascent, with our seatbelts fastened, before we reach a comfortable cruising altitude.

- Different diseases, disease communities, stages of disease, and stages of life might warrant distinct approaches to patient engagement and integration of patient input. The role of the caregiver and family members is clear in pediatric disorders, disabilities, and conditions associated with aging such as Alzheimer’s disease; individuals who surround the patients also should be factored into our understanding of unmet medical needs in mental-health conditions such as addiction and schizophrenia.

- Patients are found not only in conventional settings, such as disease-specific foundations and clinics, but also living their lives as members of social media networks and local community organizations. We need to rethink and expand the settings in which we recruit and equip individuals to be informed participants in research and care activities. This will take time to implement.

Medical products and interventions that begin with a solid understanding of patient needs and expectations promise better outcomes for the individual, families, communities, our nation, and global health. More than 75 years ago, patient engagement contributed to arresting the polio epidemic. The HIV/AIDS activists charted a path forward for the way patients can engage in all aspects of research and delivery of care under stunningly difficult circumstances. With ad-

vances in the tools we have for conducting science and communication, think of the potential we have to capitalize on the blockbuster that is patient engagement. The possibilities are endless.

SUPPLEMENTARY MATERIALS

www.sciencetranslationalmedicine.org/cgi/content/full/7/291/291fs25/DC1

Table S1. Patient engagement timeline.

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