Title
The Coming Era Of Precision Health

Permalink
https://escholarship.org/uc/item/3mt5s5qr

Journal
Health Affairs, 40(2)

ISSN
0278-2715

Author
Phillips, Kathryn A

Publication Date
2021-02-01

DOI
10.1377/hlthaff.2020.02393

Peer reviewed
There is growing interest in a concept called “precision health,” which focuses on preventing disease before it starts, using the latest technological advances to develop the tools to do so. In a new book, Discovering Precision Health: Predict, Prevent, and Cure to Advance Health and Well-Being, Lloyd Minor (dean of the School of Medicine at Stanford University) and Matthew Rees (president of Geonomics, such as the use of behavioral economics, such as the use of behavioral “nudges,” can be applied to precision health to create policies that account for how people make choices.

The authors use timely and engaging case studies to illustrate their points, including the story of how plant-based burgers got started; the creation of smartwatches that can detect atrial fibrillation; and the development of non-invasive prenatal screening tests that reduce the need for amniocentesis, and thus the risk for miscarriage. One engaging story centers on a patient who didn’t get pain relief from Vicodin (hydrocodone/paracetamol). It was only after receiving genetic testing that she learned that she lacked the enzyme to convert hydrocodone into its usable form and thereby reduce pain. Such tools (“pharmacogenomic testing”) are now moving into use in clinical care to prevent adverse drug reactions earlier.

The book also discusses the growing understanding of how blood tests can be used to screen and detect cancer earlier—including cancers for which we currently have no good screening tests, such as pancreatic and ovarian cancer. These tests, based on circulating tumor DNA and called “liquid biopsies,” may seem like science fiction, but it’s been announced that they will begin entering clinical care as early as 2021.

Yet another eye-opening example in the book is the use of artificial intelligence to identify people who are at risk for familial hypercholesterolemia, a condition caused by genetic variation that confers a much higher risk for coronary heart disease. The authors describe how artificial intelligence has been used to flag individuals at higher risk for this condition, using electronic health records, with those identified as being at higher risk then receiving full genomic sequencing to diagnose their condition. This general approach, using artificial intelligence to target individuals for more intensive care, could be applied more broadly such that sequencing and other powerful genomic tools can be targeted to those most in need, thereby improving health and perhaps even saving health care dollars.

Discovering Precision Health lays out a compelling vision, but now the real work begins: figuring out how to implement it. The authors touch on, but don’t delve into, what it will take to bring the vision of precision health to fruition. We all aspire to the prevention of disease, but history tells us that we often fall short in our aspirations. What is needed next is an agenda for developing the necessary evidence base supporting the use of precision health, using real-world data and measurable outcomes. In addition, we must determine who will pay for these advances, given that the costs are often up front whereas the benefits accrue far into the future, and which uses of precision health can provide the most value relative to costs and potential harms.