

## Personalized Health Planning

**T**here is good reason for pride in the growth of scientific knowledge and medical technology in the United States. But that cannot disguise the fact that the delivery of health care is broken and is not sustainable in its present form. Policy-makers need some direction about changes that might improve the system, and immediate action from the scientific community is needed to provide it. Corporate leaders, small business owners, workers, and taxpayers already are rebelling at the prospect of increases in health spending on the scale predicted by recent trends, while millions of Americans remain uninsured. But the boundaries set by current health care practices and financial support structures guarantee that their rebellion will fail.

That's because the current system of health care delivery is inherently wasteful and driven more by tradition than by scientific principles. Thus we believe that the best hope for breaking this impasse is to incorporate scientific advances into new models of prospective health care delivery—models that can serve the dual goals of improving outcomes while controlling costs.

Personalized health planning to anticipate and minimize each individual's risk for the onset and progression of disease is what our health care future will require. Many disciplines of the biological, physical, and social sciences can help insofar as they contribute to certain focused goals. For example, we need more powerful methods to identify individuals at the highest risk for the major chronic diseases—atherosclerosis, heart failure, cancer, diabetes, and neurodegenerative and psychiatric disorders—that account for the bulk of health care expenditures. We need more effective countermeasures to delay the progression of these conditions at the earliest stage, before the underlying pathology becomes irreversible. We also must apply measures already known to have salutary effects. Information systems can now draw meaningful statistical inferences pertinent to each individual from massive data sets that include genomic data, imaging results, and biomarker analyses along with traditional clinical variables. Such evidence, made available to clinicians working at the point of care, can direct the most appropriate preventive and therapeutic actions.

These capabilities are at hand, yet nothing at all like this happens today in U.S. clinics and hospitals. Worse, current payment systems punish providers who try to practice in a manner consistent with the best science. For example, a recent pilot program launched by our institution improved outcomes and reduced annual expenses for the care of patients with congestive heart failure from approximately \$23,000 to \$14,000 per patient. The financial consequences for our health system under current payment principles, however, were strongly negative, because patients stayed out of the hospital and avoided procedures that are relatively well reimbursed, while incurring somewhat greater expenses for ambulatory visits and patient education, for which payments do not meet costs. We call on government and private insurers to support demonstration projects to assess the efficacy of prospective health models based on scientific principles. Rationally based interventions that delay or prevent the progression of major chronic diseases could extend essential health services to all Americans and improve health outcomes within fiscally and politically sustainable economic limits.

How will a radically new system of health care on a national scale earn the public trust and foster a political consensus that has never been realized before? The scientific community and its leadership must drive an accelerated application of current scientific capacity to novel health service models, organized to promote sustained advances based on personalized care targeted to high-risk individuals. The new models must be sufficiently persuasive to revise the political dialogue on health care and to secure the enthusiastic participation of physicians. If it's done right, such care will deliver improved outcomes, affordable payment mechanisms, enhanced patient safety, and far greater involvement of individuals in their own treatment. Such efforts also must protect privacy and insurability and respect a diversity of political, religious, and ethical viewpoints. We are directing our own academic medical center at Duke to this mission and call on our colleagues elsewhere to do so as well.

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