hundred years ago, Albert Einstein upended physics with his general theory of relativity, revealing that the straightforward world Newton had described was mind-bendingly more complex. In October 2017, the Nobel Prize in Physics was awarded to scientists whose elegant experiments on gravitational waves proved that Einstein had been right. Within a week, the Nobel Prize in Economics was awarded to Richard Thaler for a comparable conceptual leap, demonstrating that our once-neat model of human decision making is far too simple to explain reality. Like the earlier efforts of behavioral economists such as Amos Tversky and Daniel Kahneman, Thaler’s work explained that people often don’t make choices by acting as the rational balancers of risk and reward assumed by classic economics. That work, along with the insights of more conventionally oriented scholars of decision making, has profound implications for medicine.

Modern physics accepted and built on the implications of Einstein’s work, and contemporary economics is grappling with applying the perspectives of Thaler and his colleagues. But most of medicine has yet to integrate the implications of current research on decision making, even though clinical practice is all about making the right choices.

The key problem is medicine’s ongoing assumption that clinicians and patients are, in general, rational decision makers. In reality, we are all influenced by seemingly irrational preferences in making choices about reward, risk, time, and trade-offs that are quite different from what would be predicted by bloodless, if precise, quantitative calculations. Although we physicians sometimes resist the syllogism, if all humans are prone to irrational decision making, and all clinicians are human, then these insights must have important implications for patient care and health policy. There have been some isolated innovative applications of that understanding in medicine, but despite a growing number of publications about the psychology of decision making, most medical care — at the bedside and the systems level — is still based on a “rational actor” understanding of how we make decisions.

The choices we make about prescription drugs provide one example of how much further medicine could go in taking advantage of a more nuanced understanding of decision making under conditions of uncertainty — a description that could define the
profession itself. We persist in assuming that clinicians can obtain comprehensive information about the comparative worth (clinical as well as economic) of alternative drug choices for a given condition, assimilate and evaluate all the findings, and synthesize them to make the best drug choices for our patients. Leaving aside the access problem — the necessary comparative effectiveness research often doesn’t exist — actual drug-utilization data make it clear that real-world prescribing choices are in fact based heavily on various “irrational” biases, many of which have been described by behavioral economists and other decision theorists.

For example, we are disproportionately influenced by the most salient and digestible information, rather than an integrated overview of all the data. This fact helps to explain the power of simplistic pharmaceutical promotional materials, often delivered to our offices along with a tasty lunch. We are also moved by the prospect of harms or losses more than by identically sized benefits or gains. Thus, the low probability of causing an intracerebral hemorrhage by prescribing an anticoagulant for a patient with atrial fibrillation can influence practice more than the opportunity to prevent many more ischemic strokes with such medications. Our beliefs are shaped by recent experiences far more than by remote events (“last-case bias”). And we often overestimate small probabilities (such as uncommon drug risks) as compared with large ones (such as drug benefits) for the same reason that many people fear dying in a plane crash more than in an auto accident, though the latter is far more likely on a per-mile basis.

Several approaches have been developed that acknowledge these human shortcomings and address them head on. “Academic detailing” is a form of educational outreach in which specially trained educators meet with doctors in their own offices to interactively discuss the physician’s understanding of a particular medication-use situation, taking into account the prescriber’s own biases and data deficits, with the goal of moving the clinician to more evidence-based drug choices. Such information transfer can’t be accomplished as well by one-way dissemination of guidelines and reprints, however data-driven, or by enforcing 1-800-NOYOUCAN’T phone-authorization requirements. This approach has been documented in randomized trials to effectively improve prescribing choices.

Some core precepts of behavioral economics have been introduced into health care, such as redesigning “choice architecture” by making use of the concept of the “nudge.” A term coined by Thaler and Sunstein, a nudge is the strategy of making a preferred alternative the default choice when several options exist. This approach can be automated and is thus highly scalable. Examples include prompts in order-entry systems that offer the best drug in a class as the default selection or present a preferred dose for a given drug on the basis of the patient’s age or renal function. But as with other automated decision aids, incautious use of this method can introduce harms as well as benefits.

Moving beyond the simplistic “rational actor” model can also be useful in improving medication-use choices made by patients, in addressing the enormous problem of nonadherence. Decades of rigorous randomized trials have proven the efficacy of safe, well-tolerated medications such as statins in preventing cardiovascular events, but most insurers impose copayment requirements that create an economic disincentive to their use. One randomized trial simply eliminated copayments for clinically useful cardiac medications for patients who’d had a myocardial infarction, thereby improving medication refill rates and reducing the incidence of subsequent cardiovascular events.

There are, of course, many aspects of medical care for which insights about the psychology of decision making will be less applicable. The kinds of interventions described here cannot address problematic choices that are influenced by economics, such as overuse or underuse of erythropoiesis-stimulating agents by dialysis centers because of payment incentives, or questionable gray-zone chemotherapy choices that can drive the revenue of oncologists and institutions that depend on such treatments for their economic success. As Upton Sinclair once noted, “It is difficult to get a man to understand something when his salary depends on his not understanding it.”

But for a large array of other economically neutral clinical decisions about therapeutic choices, the increasingly important perspectives of behavioral economics and the psychology of decision making can help us improve the outcomes of medical care and contain its costs. The natural sciences have successfully embraced new modes of understanding in physics, chemistry, and biology and built on those new foundations in order
to advance. Similar paradigm shifts have been more of a challenge for policymakers, as reflected in their difficulty in integrating insights from economics and psychology into everyday applications. Medical practice, as a hybrid of science and social science, could benefit by learning from the work of the newest economics Nobelists and other behavioral researchers, even if this work seems remote from the sciences we’re accustomed to studying. Understanding and addressing the unexpected wrinkles and twists in human decision making could yield improvements in care analogous to those based on understanding and addressing the unexpected wrinkles and twists in our patients’ DNA.

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Controlling the Swing of the Opioid Pendulum

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Mr. P. is a 34-year-old man who sees his primary care physician regularly for chronic spine pain. Several years ago, he had a motorcycle accident that left him with a ruptured spleen, a shattered pelvis, and multiple thoracic vertebral fractures. After a prolonged hospital and rehab course, he was discharged without neurologic sequelae but with a severe chronic pain syndrome. The accident was a wake-up call for Mr. P. He stopped using alcohol and drugs, got a job, and began paying child support. His daily pain regimen consisted of 3600 mg of gabapentin, 60 mg of baclofen, 120 mg of oxycodone IR (a 180-mg morphine-equivalent dose), and nonsteroidal antiinflammatory drugs as needed.

Mr. P.’s condition had been stable on this regimen for 2 years. His prescription-drug monitoring reports and urine toxicology screens were pristine. Unfortunately, his primary care physician announced that her practice had adopted a no-opioid policy. Mr. P. was given a prescription for a month’s worth of oxycodone and advised to find another prescriber in the future. Not unexpectedly, six other physicians refused to prescribe him opioids, and he ended up in our pain clinic, sobbing in the exam room, terrified that he’d end up “back in my old life” if he had to buy his pain medications on the street.

In the past year, our university-based interdisciplinary pain clinic has seen a flood of cases like Mr. P.’s. The increase in opioid-related mortality fueled by injudicious prescribing and increasing illicit use of both prescription and illegal opioids has led some clinicians to simplify their lives by discontinuing prescribing of opioid analogics. The fallout is a growing pool of patients who are forced to navigate their transition off prescribed opioids, often with little or no assistance or guidance, with the potential for disastrous results.

Well before the opioid crisis was recognized and attention was directed to opioid-related deaths, clinicians cited issues related to opioids as a principal reason why they didn’t enjoy caring for patients with chronic pain.¹ Now, many physicians and advanced care practitioners (nurse practitioners and physician assistants) have decided that the risk associated with prescribing opioids is too high. Some clinics, particularly in locations with high rates of opioid misuse, have established policies of not prescribing opioids at all.

The reasons for such policies are complex. Most clinicians have inadequate training in the modern treatment of chronic pain and had learned that opioids were safe and effective for all forms of chronic pain. Lacking knowledge about nonopioid approaches to pain management, many of us have overprescribed opioids for patients with chronic pain and now feel guilt and misgivings about the monster we’ve created. With increasing legislation and scrutiny by medical boards, phar-