When U.S. health care is good, it’s very, very good. But when it’s bad . . . well, it’s no secret that many aspects of the system need fixing. A concerted new effort at Dartmouth to study and teach how to improve the delivery of care is bringing together experts from many fields.

Jennifer Durgin is the associate editor of Dartmouth Medicine. She has written extensively about the work of Dartmouth’s health policy experts since joining the magazine’s staff in 2004.
The majority of medical errors do not result from individual recklessness,” the IOM declared. “This is not a ‘bad apple’ problem. More commonly, errors are caused by faulty systems, processes, and conditions that lead people to make mistakes or fail to prevent them.”

Glossary: A compendium of health-care delivery concepts

Accountable care organizations are groups of doctors, clinics, and/or hospitals structured to coordinate and be responsible for the continuum of care for a defined population of patients; invest in infrastructure and redesign care processes; reward high-quality and efficient services, and slow health-care spending. (Adapted from a May 2010 paper by Drs. Stephen Shortell and Lawrence Casalino in the Journal of the American Medical Association.)

Bending the cost curve is just a “highfalutin way,” according to Politico.com, of saying “lower medical costs.” In health care, it often means reducing the patient’s annual spending while maintaining or improving quality. At Dartmouth, the preferred term is “bending the value curve,” because that encompasses both cost reduction and quality improvement.

Fee-for-service is the predominant health-care payment model in the U.S. It means hospitals, doctors, and other providers are paid for performing discrete services, such as tests and procedures, regardless of patient outcomes and with little, if any, payment for coordinating a patient’s overall care.

Clinical microsystems are “the front-line units that provide most health care to most people . . . the places where patients, families, and care teams meet,” according to Dartmouth’s Clinical Microsystems Resource Source Group. The clinical microsystem approach focuses on improving quality at the micro-level unit, arguing that overall care can be no better than the quality produced by the small systems that come together to provide care. (Adapted from http://www.dartmed.dartmouth.edu/crs/)

Health-care delivery science is an emerging discipline that draws on the fields of management, economics, systems thinking and engineering, the biomedical sciences, the social sciences, health policy, and outcomes research to study and improve how health care is delivered.

Pay-per-performance is a payment model that gives health-care providers financial incentives for meeting quality, efficiency, and safety targets. For example, an insurance company or government payer might provide higher reimbursements to physicians who make sure that their diabetic patients receive annual eye examinations.

Primary-care-sensitive care refers to treatments for conditions where more than one legitimate treatment option exists and the options involve different risks and tradeoffs. “Decisions about these interventions—whether to have them or not—and which ones to choose among patients of similar values and preferences, and should be made only after patients have enough information to make an informed choice, in partnership with the physician,” says the Dartmouth Atlas of Health Care.

Shared-decision making (a.k.a. informed patient choice) is the process by which a provider communicates to a patient or caregiver about the available options, probabilities, and scientific uncertainties of available treatments for that patient’s condition. The patient, in turn, communicates his or her values and the relative importance he or she places on relevant benefits, risks, and side effects. (Adapted from the web portal for the National Conference on Medical Decision Making—see www.informedmedicaldecisions.org.)

Supply-sensitive care “refers to services where the supply of a specific resource has a major influence on utilization rates.” The frequency of use of supply-sensitive care is not determined by well-articulated medical theory, much less by scientific evidence; rather, it is largely due to differences in local capacity, and a payment system that ensures that existing capacity remains fully deployed. Simply put, up regions where there is more or less demand will be more likely to be admitted to the hospital,” according to the Dartmouth Atlas of Health Care (see www.dartmed.dartmouth.edu/)

Practice variation refers to dramatic differences from region to region in the amount, intensity, and cost of health care provided to patients. These variations cannot be explained by socioeconomic factors, illness severity, medical evidence, or patient preferences.

Value-based care is health care that aims to deliver high value, with value equating the health outcomes achieved for the patient divided by the total expenditure required to achieve those outcomes. The goal is to simultaneously deliver higher-quality care at a lower cost.
The cost of health care as a share of the gross domestic product more than tripled in the United States between 1960 and 2008—from 5.2% to 16.2% of GDP. The rise in spending on health-care utilization. Even Wennberg’s work documenting and studying geographic variations in health-care procurement. Kim and Weinstein agree that TDI and its research will form the foundation of the new Center. Not just the variations studies, but that’s the work that generates the most attention.) Among Wennberg’s and his colleagues’ most important and best-known discoveries is the finding that hospitals and regions that spend the most money on health care, TDI, originally known as the Center for the Evaluative Clinical Sciences, offers three graduate degrees (M.H.S., M.S., and Ph.D.) and encompasses a diverse group of researchers. For example, some TDI faculty specialize in how information is communicated to patients and the public. Others focus on population health, patient safety, and quality improvement. Still others build on Wennberg’s work documenting and studying geographic variations in health-care utilization. Even those who don’t work in the exact same field as Wennberg says he was pivotal in TDI’s development as the only institution of its kind in the country. As one TDI faculty member puts it, Wennberg was “the gravitational force that pulled in other luminaries and created something so special here.” Wennberg’s influential work dates back to the early 1970s, when he revealed that much of what doctors do is based on personal preferences and beliefs, not data. For example, he found that in one town in Vermont, nearly 70% of children had had tonsils removed. But in a neighboring and nearly identical town, only 20% had a tonsillectomy. The cause, to his surprise—and the disbelief of nearly everyone else—was variation in the practice patterns of individual doctors. In the nearly 40 years since then, Wennberg and his colleagues have continued to document dramatic, widespread variations across the United States, as well as elsewhere, in the treatments for dozens of conditions—including heart disease, end-of-life care, and back pain, to name just a few. And these variations cannot be explained by socioeconomic factors, prevalence of illness, medical evidence, or patient preference. The mechanism behind doctors’ influence on variations in care depends on the category of care, explains Wennberg in a new book, Tracking Medicine. “For preference-sensitive care, epitomized by elective surgery, the most important factor is the physician’s opinion about the outcomes of various treatment options and the physician’s belief about the patient’s preference.” Research from Dartmouth-Hitchcock Medical Center, Wennberg, an orthopedic surgeon and TDI alumnus, also founded DHMC’s Spine Center and its first-in-the-nation Center for Shared Decision Making, both are national models for informed patient choice. Kim argues, is that there are no other academic groups with such a comprehensive and robust data base about health outcomes and delivery. So TDI became “the singular source of information for decision-making,” says Kim. “We are one academic group, and there should be many other academic groups with plenty of funding so that they could approach this in a different way. Let’s have the academic debate and provide all the information in understandable ways to legislators and then, at the end of the day, they’ll make the decision about…policy.” In fact, informing policy is a primary goal of the new Center. “Some people say that academic institutions cannot influence health policy,” says Kim. “I disagree. Frankly, I’ve done it… I have personal experience on changing policy on things like drug-resistant tuberculosis and HIV.” And, he adds, “the Dartmouth Atlas has had a huge impact on policy already.” Then—quoting Dr. Julio Frenk, dean of Harvard’s School of Public Health and a former minister of health in Mexico—Kim says, “Never underestimate the power of ideas to change the ideas of power.” A central concept— but certainly not the only one—that will drive the Center’s research, educational offerings, and policy work is summarized by Harvard’s Michael Porter, a prominent strategy guru in the business world who turned his attention to health care almost a decade ago. “The real constraint today is fundamentally a managerial and organizational constraint,” explains Porter, who is already collaborating with the Dartmouth Center for Health Care Delivery Science. “It’s not that we don’t know what to do or that we don’t have good technology. It’s the capacity to deploy technology, deploy knowledge, to really deliver.” In 2001, the Institute of Medicine reported that it “takes an average of 17 years for new knowledge generated by randomized controlled trials to be incorporated into practice.” That extremely slow adoption rate for innovations and best practices—an average of 17 years, according to a 2001 Institute of Medicine report—is one of the major reasons why health care has lagged behind other industries in terms of improving quality and containing costs.
Robert Hansen, senior associate dean at Dartmouth’s Tuck School of Business, thinks that no other business, public health, and medical schools are “doing partnership and alliance” at this level. He admits that it is not easy to mesh the disciplines. “But it has to be done,” he says.

**MASTERY: A look at the center’s first educational offering**

Every system is perfectly designed to achieve the results it gets.” That’s the “central law of improvement,” according to Donald Berwick, administrator of the U.S. Centers for Medicare and Medicaid, and his longtime collaborator Dr. Paul Batalden, a Dartmouth professor who pioneered a quality improvement concept called clinical Microsystems. It then follows that to get different results, the system has to change. That is the principle behind Dartmouth’s new master’s degree in health-care delivery science (see http://tdi.dartmouth.edu/). That program will produce “a group of graduates who knows what to do and how to get it done.”

The new degree, the first to be offered by the Center for Health Care Delivery Science, will draw on the expertise of faculty at both TDI and Tuck. TDX has a long tradition of thinking differently about health care. Known for its groundbreaking research, TDI remains the foremost authority on practice variations, the measurement of health outcomes, shared decision-making, and clinical microsystems. A top-tier business school, Tuck is known for its expertise in accounting, operations and financial management, strategy, and leadership.

Combining the Tuck and TDI skill sets is not a new idea. TDI researchers have worked closely with health economists at Tuck for years now. And DMS and Tuck have offered a popular elective called Medical Care and the Business of Medicine for more than a decade, and a course was started by Michael Zubkoff, a health economist who has chaired DMS’s Department of Community and Family Medicine since 1975 and who nurtured TDI in its earliest days. The course brings together DMS M.D. students to study the critical issues facing the health-care system—including cost, quality, and access.

The students look at problems from different perspectives, says Paul Gadert, one of the professors who now teaches the course (and a 1976 Tuck alum). Gadert has spent his career straddling the worlds of health and business for 27 years, earning an M.B.A. from Tuck and a doctorate from Dartmouth’s Tuck School of Business, where he was the director of the Center for Health Care Delivery Science. (For more about the concept of clinical Microsystems, see dartmed.dartmouth.edu/tdi/01/)

“Quality was redefined as a journey toward a goal you never arrive at,” explains Eric Wadsworth, one of the faculty codirectors of Dartmouth’s new master’s program in health-care delivery science, which will be the first degree offered by the Center (see the box on the facing page for more on this new program). Wadsworth was chief financial officer of Dartmouth Medical School for 10 years and until recently led the office of professional education at TDI. Wadsworth has said that continuation quality improvement usually leads to a reduction in costs and a higher value for consumers, Wadsworth explains. That is, getting Tuck and TDI students to study the critical issues facing the health-care system—including cost, quality, and access.

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Experts have been calling for more and better measurement in health care. “We’ve been flying the health-care airlines with no instruments,” observes Weinstein. Ultimately, what health-care delivery science is all about, he says, is “real people” and their experiences with the health-care system.

Throughout Medicine: A Researcher’s Quest to Understand Health Care

By John E. Wennberg, published by Oxford University Press, 2010

Refining Health Care: Creating Value-Based Competition on Results

By Michael E. Porter and Elizabeth Monges, published by MIT Press, 2009

Designing Care: Aligning the Nature and Management of Health Care


BIBLIOGRAPHY: A list of further readings in the field

Tracking Medicine: A Researcher’s Quest to Understand Health Care

By John E. Wennberg, published by Oxford University Press, 2010

Refining Health Care: Creating Value-Based Competition on Results

By Michael E. Porter and Elizabeth Monges, published by MIT Press, 2009

Designing Care: Aligning the Nature and Management of Health Care


Weinstein, the founding father of health-care delivery research, cautions in his book that “getting beyond the ‘more is better’ assumption will likely require a national debate on the limitations of medicine’s power to heal and care, and on the quality of care at the end of life.”