For half a century,” Dr. John Wennberg declared in a 1977 issue of Pediatrics, “the tonsil has been the target of a large-scale, uncontrolled surgical experiment—tonsillectomy.” Jack Wennberg had just taken the pin out of a grenade—and he knew it. With the phrase “uncontrolled surgical experiment,” he acknowledged what few doctors at that time would admit: they operated on people without knowing, with certainty, whether the procedure would do the patients any good. And in this case the patients were children.

During the 1930s and 1940s, half of the nation’s children had their tonsils removed, but “since World War II,” Wennberg reported in that article, “opinion has swung away from mass use” (emphasis added). By 1973, he added, only 25% of the nation’s children were undergoing the procedure. (Nevertheless, though its popularity had ebbed, tonsillectomy remained the second most common procedure in the United States, after circumcision.)

The word “opinion” in that passage is jarring. What could Wennberg mean? After all, by 1977 medicine was firmly established as a science. Wasn’t it? Surely doctors would not subject millions of children to a painful and potentially risky operation unless they had solid evidence that the surgery was truly needed.

Not according to Wennberg. With a boldness that is surprising, even today, he went on to compare doctors to meteorologists: “Physicians are weathermen: they predict and act on the basis of their own imperfect information.”

Jack Wennberg has battled uncertainty in medicine—and foes of his findings—for 35 years. His weapons have been intellectual bravery and a dogged sense of doing the right thing. Now hailed nationwide for his iconoclastic ideas, he has just stepped down from leading the troops he assembled at Dartmouth.

By Maggie Mahar
The health-care system and analyzing how resources were used in different regions, Wennberg found, yielded important insights into health-care variations. This photo dates from his Vermont years. It was his children—specifically their tonsils—from whom Wennberg got his first insight into health-care variations. This photo dates from his Vermont years. In the early 1970s, when Wennberg began puzzling over tonsillectomy rates, he was working at the University of Vermont as the director of the state's Regional Medical Program. The role involved studying the health-care system and analyzing how resources were used in different parts of the state. He identified geographic variation in the rate of certain operations, including appendectomies, hysterectomies, prostate surgeries, and gall-bladder removals. Moreover, Wennberg had begun to demonstrate a clear connection between a community's supply of health-care resources—such as surgeons and hospital beds—and how much surgery the residents of that community received. More surgeons and more beds equalled more procedures. Put simply, supply seemed to drive demand.

Four years before his article appeared in Pediatrics, Wennberg had published, in the journal Science, his first study about geographic variations in health care. There, he and his co-author, Dr. Alan Gittelsohn, established a firm connection between the supply of health-care resources in a community and how much care its citizens received. At the same time, they acknowledged that they could not say which rate of care represented "a better allocation of resources." For a given surgery, it was not clear whether patients in communities where surgeons were in relatively short supply received too little care, or whether those in areas with a surplus of surgeons got too much. "In studies that have tried the comparing outcomes in controlled circumstances," Wennberg explained at the time. "Sadly, the situation hasn't improved much. "Jack's first paper in Science was so on target," says Dr. James Weinberg, an orthopaedic surgeon at Dartmouth. "This is what we are working on today." Wennberg, in fact, heads the largest randomized surgical trial ever funded by the National Institutes of Health—a comparison of surgical and nonsurgical treatments for various kinds of back pain. And it is Weinberg who has been named to succeed Wennberg as the leader of the people and projects Wennberg assembled at Dartmouth.

More harm than good

But before those people and projects existed, even before Wennberg's arrival at Dartmouth, he began to realize just how much was at stake: "Given the magnitude of the variations," he wrote in 1973 in Science, "the possibility of too much medical care and the attendant possibility of iatrogenic illness [illness that is caused by medical care] is pre- sumably one of the kep possible causes of oversupply and understated morbidity and mortality." In other words, in towns blessed with many surgeons, the extra surgeons actually might be doing more harm than good. "This is not what Wennberg's peers in the medical profession wanted to hear. "In fact, he almost didn't get that first paper published," Wennberg says. "We tried the New England Journal of Medicine and the Journal of the American Medical Association. . . . We tried all of the medical journals," he recalls. "What did the reviewers at those journals say? Wennberg chuckles. "They didn't say anything. We got form rejection letters." "(This still happens," he notes in an interview in Health Affairs in 2004. "Generally we don't bring good news."

Back in 1973, Wennberg's initial article appeared in Pediatrics. When Wennberg looked at the health-care data for the two neighboring Vermont towns, he realized that 70% of the Stowe children had had their tonsils out by the time they were 15 years old, as opposed to only 20% of those in Waterbury. "They didn't say anything. We got form rejection letters." "(This still happens," he notes in an interview in Health Affairs in 2004. "Generally we don't bring good news."

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The problem is all of that stuff is so antithetical to the dominant ideology in the medical community—so antithetical that they can't bear to talk about it, Wennberg reflected a few months ago. "The fact that he spoke in the present tense suggests that the "dominant ideology" lingers still. But what exactly is that ideology? "Manifest efficacy," Wennberg says, smiling. "Everything we do is magic. It's not just medical technology," Wennberg continues. "In the past, this wasn't so important. And it didn't cost so much. But now it's expensive. It's costly not just in dollars, but in the cost for patients." In today's "uncontrolled experiments," patients who undergo surgical treatments run a serious risk of life-changing side effects—in the case of early intervention patients run a serious risk of life-changing side effects—in the case of early
Wennberg's interest in social change translated into a fascination with epidemiology, the root causes of illness, and the health of the health-care system itself. “I was interested in measuring process, structure, and outcomes,” he explains.

Eventually Wennberg made converts. With him here, in 1989, are two—Maine surgeons Bob Keller (left) and Hal Sox (right), then chair of medicine at DMS.
a very controversial appointment,” Strickler recalls. Zubkoff wasn’t an M.D.—he had a Ph.D. in economics from Columbia. Initially, Strickler had been opposed to the idea of naming someone not a physi-
cian to chair a clinical department. But when Strickler met Zubkoff, he was surprised: “I thought he made a lot of sense. I thought he had good ideas. I liked his values.”

Once he landed the job, Zubkoff knew he wanted to bring Jack Wennberg to Dartmouth. “When I was offered the job, that was the first call I made,” he recalls. “I had met [Wennberg] and I knew his work in Vermont and Maine. And I also knew that he had been run out of town in Vermont.” Zubkoff believed that Wennberg embodied “the best example of someone who bridged clinical medicine, eco-
nomics, and an understanding of markets.”

Peeling back the onion
Even so, it took Zubkoff a couple of years to put all the pieces togeth-
er to bring him to Dartmouth. Meanwhile, he says, Wennberg “did more papers, and they were well-received. And he was just very persistent. He was able to stick with the theme: ‘There are these variations in how we care for very similar patients. Why?’ Wennberg peeled the onion back and kept going deeper and deeper.”

“Professionally, my claim to fame is that I recruited Jack.” And I’m no slouch,” Zubkoff adds, laughing. “I was elected to the Institute of Medicine. But just as I define myself personally as the father of my children, professionally I’m the guy who brought Jack Wennberg to Dartmouth.”

Strickler, too, looks back on the appointment with pride: “It was the best thing I did as dean of the Medical School aside from balanc-
ing the budget.” It’s not easy to come up with the funding for a per-
manent appointment for Wennberg. And there was even some resis-
tance to his work within Dartmouth. “There were some hard-core sci-
entists—biochemists, physiologists—who were skeptical and viewed what Wennberg was doing as a soft science, fuzzy sociology,” Strick-
ler recalls.

“But within four or five years of his arrival, the people who were opposed to his appointment had run out of steam. After that, Strick-
ler continues. And ‘Jack managed to co-opt our clinical faculty by working with them collaboratively.'” Wennberg proved to be not only a supportive colleague but also a charismatic mentor. Soon he was no longer a lone voice. He began to build a research empire, and that spawned an educational institute.

Wennberg’s career reached a turning point in 1984. That year, he published “Dealing With Medical Practice Variations: A Proposal for Action” in Health Affairs. The journal presented his work without apology. Indeed, the prologue to the piece underlined the importance of his still-then largely unsupervised labors: “Without much attention from the profession and virtually no public fanfare, John Wennberg has been tracking the phenomenon of variations in the use of med-
ical care for more than a decade. Wennberg, who ranks among the leaders of the nation’s tiny cadre of medical-care epidemiologists, has been driven by the notion that practice variations were important to identify and understand because they suggest a mouse of care. . . .”

During his research pursuits, Wennberg has uncovered systematic and persistent differences in the standardized rates of use for common sur-

tical procedures and other medical services in the United States.”

“Most people who practice the medical care they receive are not as knowledgeable as physicians who provide what they need and what they want,” Wennberg wrote. “But, persistent as always, Wennberg pursued the ‘outcomes research’ approach.”

“Professionally, my claim to fame is that I recruited Jack. And I’m

as whether treatment occurs in the ambulatory or the inpatient set-
ing. . . . To resolve the differences in opinion—and to learn whether high or low rates of admission reflect appropriate care—more scien-
tific information must be obtained.”

“For other conditions, the practice style factor appears unrelated to scientific controversies. Physicians in some hospital markets prac-
tice in ways that have extremely adverse implications for the cost of care, motivated perhaps by reasons of their own or their pa-
tients’ convenience, or because of individualistic interpretations of the requirements of ‘defensive medicine.’ Whatever the reason, it certainly is not because of adherence to medical standards based on clinical outcome criteria or even on statistical norms based on aver-

gage performance.”

Wennberg went on to demonstrate, once again, that the supply of hospital beds and specialists in a particular market often determines how medicine is practiced—even at the most prestigious medical centers.

Comparing the health-care markets in New Haven, Conn., home to Yale’s teaching hospital, and in Boston, home to Harvard, Wennberg found that per-capita health-care costs were about twice as high in Boston, “largely because Boston had more ‘beds and medical personnel per head’ than New Haven.”

Basically, because the beds were there, physicians used them. To this day, Dartmouth studies show that in areas with more specialists, patients tend to see specialists because the specialists have more time open in their appointment books. Yet doctors in these mar-

kets aren’t consciously aware that they are hospitalizing or seeing pa-
tients more often. In the 1984 article, Wennberg reported that when he ‘asked clinicians who have practiced in both Yale and Harvard teaching hospitals to estimate the per-capita expenditures in each market, their answers indicated[that] they had no awareness of the mag-

itude of the difference. What is more surprising, many [did] not ac-

curately guess which of the two markets is the more expensive.”

In a 1984 paper in Health Affairs, Wennberg went on to demonstrate, once again, that the supply of hospital beds and specialists in a particular market often determines how medicine is practiced—even at the most prestigious medical centers.

By 1993, the CECS cadre had attained sufficient critical mass to begin teaching those methodologies. Today, the program offers two master’s degrees (M.S. and M.P.H.) and a Ph.D.

In 1996, CECS published the first Dartmouth Atlas of Health Care—taking the concept Jack Wennberg had developed in Vermont and Maine, then used in New Haven and Boston, and applying it to the whole country. Since then, the Atlas has become a standard reference work for health-care professionals, policy makers, and the public. The CECS also produces reports and papers, and offers a number of other educational programs. Wennberg continues to be a key player in the field, and his work has been widely recognized by his peers and by the public.
WENNBORG (seated on the left) holds the nation’s first endowed chair devoted to outcomes research. Pictured with him—at the chair’s 1994 dedication—are his wife, Gorelia (far left), and the chair’s donors, Andrew and Peggy Thomson. Drawing upon Wennberg’s pioneering work, Dartmouth’s Center for Evaluative Clinical Care (CECS) has become the leading authority in outcomes research. Pictured with Wennberg is Dr. Elliott Fisher, who became the lead researcher on studies that revealed, virtually beyond doubt, that in many cases, outcomes research from the ground up, to directly compare the effectiveness of various treatments. “I said, ‘Orthopedists and neurosurgeons do this together, with primary-care doctors, and actually collect data on how our patients are doing,’” Wennberg says. Even then, at Dartmouth, he met with some resistance. “We’re too busy,” some doctors said. “This is going to interfere with my practice,” others complained.

But Wennberg was undeterred. “My daughter’s experience in [the] health-care system had been pretty chaotic,” he recalls. “There were errors, she was given the wrong drugs, there were complications from chemo and they were not well explained. So I really didn’t mind the noise about the effect on their practice, I was concerned about the effect on the patient.” By this time his daughter was very sick once again. In 1997, a year after his return to Dartmouth, his daughter died. She was 12½ years old. “This really tested my spirit,” Wennberg says. “Either you withdraw and go into your hole, or you draw on it for strength. She had become my hero,” he continues. “She never complained about anything. She had suffered a lot for a long time while we had pushed on from one experimental treatment to another experimental treatment. And the doctors would say, ‘This is the protocol. This is what we do next.’ I wouldn’t want my daughter to have been with us for one day less, but . . . ” His voice trails off.

One can only imagine the agony for Wennberg—who had always worried about overtreating his patients—of being forced to make treatment decisions for his daughter. Impossible decisions, given the paucity of information about risks, benefits, and options. When doctors say “This is the protocol,” they are simply stating “This is the way we do it.”

“Why not whether they know why.”

“After my daughter’s death,” Wennberg goes on, “my wife and I felt an obligation to try to make it better for other people. . . . So I didn’t give up practicing medicine. I didn’t want to lose my chance to change the world of medicine from within.”

And then I was asked to become the chair of the orthopaedics department—something I hadn’t expected. It gave me a chance to continue on page 68.
Braveheart: Jack Wennberg

advocate for the changes I wanted to make.”

What did he change? “Everything,” says Weinstein, suddenly grinning with enthusiasm. He began by connecting the department’s teaching and research missions with its clinical mission. “Part of the problem with geographic variation in how we treat patients has to do with lack of evidence,” he observes. “If we knew what to do, there wouldn’t be such variation.

“I came here not just to understand the maps,” says Weinstein, referring to the Dartmouth Atlas maps, which make very graphic the variations in care from one part of the country to another. “What I want to know is this,” he goes on. “How do we change the maps?

“When it comes to many types of surgery, technology is changing so fast—ahead of our ability to evaluate it,” he points out. “It’s very hard to rein in.” The Food and Drug Administration, for example, approves devices without requiring either long-term research about risks or evidence that a new product is any better than products already on the market. Thus the patient becomes the guinea pig for unproven procedures—without knowing that he or she is part of an “uncontrolled experiment,” to use Wennberg’s 1977 phrase.

Other countries have set up registries of devices like pacemakers and artificial joints, to track how well patients function with a given company’s device and how long different devices last over time. The U.S., however, has no such resources. “We’ve been pushing for joint registries—we’ve gone to Medicare and the FDA,” says Weinstein. “Why wouldn’t companies want to know?” He’s not giving up, however. In that way, Weinstein learned well from Wennberg.

But everyone agrees Wennberg set the bar high. His combination of intelligence, tenacity, and courage have left a deep imprint. The partisans he has trained and inspired are now effecting change all across the country. The national debate about health policy has been forever altered. Even the enterprise he founded at Dartmouth is undergoing alteration. When Wennberg stepped down from CECS’s helm, the organization acquired a new name—the Dartmouth Institute for Health Policy and Clinical Practice—as well as a new leader.

That new director, Jim Weinstein, remains grateful that fate brought him to Dartmouth. “Jack gave me a way to see things differently—and a chance to change things. I feel very fortunate.”

He and many others at Dartmouth have been singing Wennberg’s praises in the wake of the leadership change. But so, too, have movers and shakers well beyond Dartmouth. In the November/December 2007 issue of Health Affairs, the journal’s 25th anniversary issue, Jack Wennberg was named “the most influential health-policy researcher of the past 25 years.” And he received the 2007 Ernest Amory Codman Award from the Joint Commission, the national accreditation body for health-care organizations, for his “leadership role in using outcomes measures to improve health-care quality and safety.”

Blueprint for reform

The anniversary issue of Health Affairs also contains two articles by Wennberg and others at Dartmouth—articles that are, in effect, a blueprint for health-care reform. The first, subtitled “How Medicare Can Improve Patient Decision Making and Reduce Unnecessary Care,” looks at elective surgery, arguing that Medicare should make shared decision-making the standard for deciding if discretionary surgery is medically necessary.

The second paper (“How Medicare Can Reduce Waste and Improve the Care of the Chronically Ill”) notes that at present “the care of Americans with severe chronic disease is disorganized, unnecessarily costly, and undisciplined by sound clinical science.” Wennberg and his coauthors urge the federal government to invest in a “crash research program” designed to rapidly accumulate the evidence needed to determine the best and most efficient way to manage chronic diseases like asthma and diabetes. More efficient care would better serve patients and be less costly, the authors point out. Any cost savings, they suggest, should be shared with providers who deliver the most effective, efficient care. Both articles share the same vision: the health-care payment structure needs to reward the quality, not the quantity, of care a provider offers.

The political reform that Wennberg’s critics were so afraid of back in the 1970s just may happen one day.