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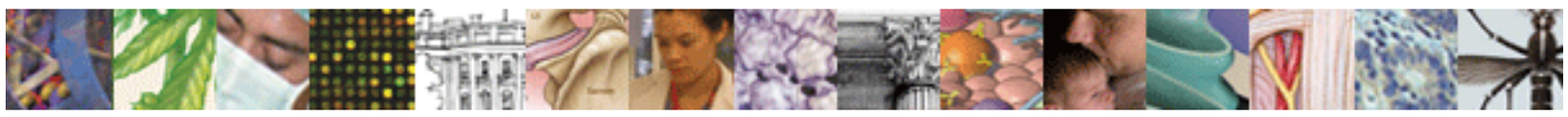

Perspective

Pledging to Eliminate Low-Volume Surgery

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On May 18, 2015, leaders at three hospital systems — Dartmouth–Hitchcock Medical Center, the Johns Hopkins Hospital and Health System, and the University of Michigan Health System — publicly announced a "Take the Volume Pledge" campaign to prevent certain surgical procedures from being performed by their surgeons who perform relatively few of them or at their hospitals where relatively few such procedures are performed. The Pledge, promoted by long-time advocates of quality improvement such as John Birkmeyer and Peter Pronovost, challenges other large health systems to join them in restricting the performance of 10 surgical procedures — including gastrointestinal, cardiovascular, and joint-replacement surgeries — to hospitals and surgeons who perform more than a minimum number. The annual volume thresholds range from 10 per hospital and 5 per surgeon for carotid stenting to 50 per hospital and 25 per surgeon for hip and knee replacement.

AUDIO INTERVIEW

Interview with Dr. David Urbach on a plan to concentrate certain surgical procedures among the physicians and hospitals that perform the most of them. (9:55)

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The reaction of surgeons to the Pledge, which was widely promoted in *U.S. News & World Report* as part of its Best Hospitals for Common Care rankings, was predictably hostile — and completely out of proportion to the modest ambition of the Pledge. Of all the possible approaches to restricting surgical care to high-volume hospitals, perhaps the least controversial ought to be a decision by a large metropolitan academic hospital system that its most complex elective surgery should be performed by the providers and hospitals that do the most of a given procedure. (The Pledge is silent on the question of performing complex surgery in independent small and rural hospitals.) If volume-based distribution of surgery cannot be accomplished in this context, then it's probably not going to happen anywhere.

Proponents of the Pledge have presumably calculated that starting with such an easily achievable policy could be the thin end of the wedge for broader efforts to centralize complex surgery. Nevertheless, a discussion board of the American College of Surgeons quickly filled with dozens of postings, almost all bristling at the idea of external organizations imposing volume standards on surgery, arguing instead for quality-based standards, and taking particular offense at the portrayal of low-volume surgeons as hobbyists who are motivated by professional autonomy and pride to continue performing rare procedures despite the clinical and economic consequences.[1]

For anyone wondering why we are still discussing surgical volume 36 years after Harold Luft pointed out the relationship between higher surgical volume and lower postoperative mortality,[2] and why even limited initiatives such as the Pledge elicit such controversy, it is useful to reflect on how we got here and what it means for the prospects of quality improvement in surgery.

There is no doubt that the outcomes of elective surgery — as measured by postoperative mortality, complications, or a wide array of other measures — are better when an operation is done by a

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surgeon or in a hospital with a high procedure volume. The volume–outcome effect is a remarkably consistent finding in studies of surgical services, and it applies not only to surgery, but also to many types of nonsurgical hospital-based care, such as treatment of congestive heart failure and chronic obstructive pulmonary disease, obstetrical care, trauma care, and intensive care. The mechanism underlying the volume–outcome effect has considerable importance for developing health policy to improve surgical care. If selective referral of patients to providers with excellent outcomes explains the effect, then it is important to identify and promote the best providers to help consumers choose where to go in the health care marketplace. If, on the other hand, outcomes improve because hospitals and surgeons gain expertise with incremental experience through a “practice makes perfect” mechanism, then the focus should be on dissemination of best practices and quality improvement.

Some experts on surgical quality have argued against using procedure volume as a measure of excellence for surgery. There is a vast body of research on surgical services and their outcomes, in no small part because surgery happens to be particularly easy to study. In contrast to many other areas in clinical medicine, surgical operations are discrete episodes of care that fit into orderly categories and are easily and precisely identifiable using routinely collected data. A hallmark outcome of surgery — postoperative mortality — is also easily measurable, clinically important, and conceptually linkable in a cause-and-effect manner to a recent surgical procedure. The proliferation of readily available and inexpensive sources of health information such as Medicare and state hospital-discharge data has made it possible for many researchers to analyze surgical outcomes — and has led some to wonder why, instead of using volume to identify the best providers of surgical care, we don't just measure outcomes directly.

Unfortunately, the embarrassment of riches of surgical outcomes data may be more like fool's gold than real gold. For one thing, the surgeon's act of selecting patients for surgical procedures is so fundamental to the practice of surgery that it's extraordinarily difficult to identify and adjust for selection bias when reporting surgical outcomes, even with state-of-the-art methods of risk adjustment. Beyond the concern that a provider's surgical outcomes may be biased owing to patients' coexisting conditions or severity of illness, large-scale attempts to distinguish surgeons or hospitals on the basis of their outcomes have proven largely uninformative. Few poor performers are identified, some of those are random statistical outliers, and many low-quality hospitals will never be identified as outliers because of small sample sizes and the rarity of serious complications.[3]

Disappointingly, it also appears that knowing and acting on outcomes information does not necessarily help hospitals improve care. The National Surgical Quality Improvement Program of the American College of Surgeons provides participating hospitals with reports of their risk-adjusted outcomes using clinical data collected by trained abstractors from medical records. Even this program, the poster child for outcomes-based quality-improvement initiatives using high-quality data collection and comprehensive risk adjustment, did not lead to improved surgical outcomes among the hundreds of hospitals where it was introduced.[4]

Surgical outcomes are a reflection of structures and processes of care — the tools that hospitals and surgeons have and the things they do. For care to be improved, surgeons and hospitals must know what to do to best manage their patients' care. Such advances in knowledge seem to be occurring naturally: outcomes have been improving over the years, only in part owing to market concentration in high-volume hospitals.[5] Surprisingly, aside from isolated initiatives such as Hospital Compare from the Centers for Medicare and Medicaid Services that provided data on perioperative interventions for prevention of surgical-site infection and venous thromboembolism, quality-improvement initiatives in surgery have largely ignored processes of care, favoring instead the alluring prospect of easily available outcomes data. Regardless of what happens with efforts to centralize certain surgeries in large hospitals, some patients will continue to require surgery — and other types of acute care — at small hospitals, and care for these patients will improve only if structures and processes of care in those hospitals can be improved.

Is a Volume Pledge a good idea? It definitely makes sense for the large hospital systems to which the current campaign is directed. The biggest problem, of course, is that the Pledge — or any attempt to move patients from one hospital to another, for that matter — does nothing to improve the quality of care provided to patients in low-volume hospitals. To the extent that variation in the structures and processes of care in some smaller hospitals underlies the striking variation in outcomes observed in volume–outcome studies, moving patients from one hospital to another simply exploits the existing variation in quality of care to improve the outcomes for patients who have the opportunity to be moved to larger hospitals. Redirecting a few patients requiring complex elective surgical procedures to high-volume hospitals is relatively easy. Broader improvements in the outcomes of surgical care — and hospital care in general — will require changes in the tools available to providers everywhere and in what they do with those tools. And that type of change is difficult indeed.

Disclosure forms provided by the author are available with the full text of this article at NEJM.org.

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