



## *Improving the Quality of Health Care: What Strategy Works?*

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How can an entire health care delivery system improve the quality of its care? This question, posed from the perspective of the whole delivery system, is likely to have different answers than if it were posed by a single institution or health plan. I believe three strategies are possible: regulation, professionalism, and competition. This discussion assesses each approach.

### *Strategies for Improving Quality of Care: Advantages and Disadvantages*

The theory behind regulation is simple. One sets standards that define good quality, inspects to determine if standards are being met, and punishes violators. Although it is still used widely, regulation is out of fashion, because of its disadvantages. These disadvantages may seem obvious, but should be enumerated.

The regulatory approach to quality improvement is rigid and inflexible. It cannot account for subtle variations in patient presentation or in circumstances that would require deviations from the standards under good medical practice. It cannot motivate the best of physicians or other health professionals to improve, because it is concerned with setting a floor below which no one should be permitted to fall. As a result, regulation is a poor device for motivating the average or even the slightly below average components of a health-care system. Regulation can, in fact, block motivation for quality improvement among the vast majority of

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providers because so much energy is devoted to ensuring that the floor is well maintained; not much is left for creative approaches to raising the ceiling.

Regulation does have some advantages, however. They are worth pointing out because they often are overlooked in the current debate. The first advantage is that, unlike many other approaches, regulation reaches all providers in the delivery system. Few other approaches can accomplish that. In my opinion, regulation is the only way to address the “floor” problem and to remove from the system the few who are so egregiously bad that they deserve to be removed. Those who care about good-quality health care should not lose sight of that fact. It also allows planning and action to be taken on a community-wide basis; again, few other approaches permit such planning and concerted action.

Professionalism used to be called “volunteerism” and now seems to be called “continuous improvement.” The approach essentially reduces to providers saying, “Let us do it. We are the professionals.” Whether the message comes from doctors, nurses, hospital administrators, HMO directors, or others in health care, it always seems to say, “We know best; we take care of patients; we know how to improve quality; we are on the front lines. Decentralize this; leave it to us.”

Professionalism has several advantages. It is a strong motivator for those who are interested and enthusiastic. Indeed, I would argue that professionalism is probably the most effective way for a single institution to demonstrate improvement, if it can organize itself to take advantage of the opportunity.

Professionalism has a number of disadvantages, however. The first, from a community standpoint, is that too few institutions or organizations, whether hospitals, nursing homes, or HMOs, are so committed to quality that it is a paramount concern every day of the week. Industry provides a salient example of this reality, where most would agree that the application of total quality management (TQM) leads to improved productivity, profitability, and market share. If one asks leaders in this field what proportion of industries have adopted TQM enthusiastically and pursue it the

way the experts suggest it should be pursued, the answer usually comes back as a one-digit number or a very low two-digit number, such as 10% or 15%. I submit that prospects are dim for the professionalism virus infecting a sufficient portion of the health-care delivery system that society could rely only on professionalism to achieve improvement in the community as a whole.

It has become fashionable to talk about the third strategy, competition. The principle was articulated during the health reform debate by the managed-competition advocates, who said, essentially, that an environment or market should be created such that hospitals, physicians, and health plans will compete on quality. The argument is that such an environment will be achieved by collecting information on quality, by means of devices such as report cards; the resulting information would be published and made widely available. Consumers will then use that information to select health plans or doctors or hospitals; health plans can use it to create their networks. Because doctors, hospitals, medical groups, and health plans will know that their business depends on being able to perform and improve on these measures, competition on quality will ensue.

The theory may be appealing, but it has problems. One problem is that such an environment does not exist anywhere in the real world. There is no market anywhere, certainly none outside the United States, nor, I would argue, even within the United States, that functions as described, even in the regional managed-care markets that have been put forward as models.

Managed-care organizations in the United States compete on price. A recent survey by Foster Higgins<sup>1</sup> documented the magnitude with which that occurs. Sixty-nine percent of more than 100 managed-care companies surveyed said that they attributed their success in the marketplace to competition on price; only 9% said that quality information, or outcome data, influenced their success.

The second problem with competition as a mechanism for ensuring quality is that there are enormous practical difficulties with making this happen. Aside from the problems that would have to be overcome in developing the quality measures that

would be needed, and the fact that the science-related aspects of the data—reliability, validity, and timeliness—would be suspect because such data typically age quickly, applying the data would be a daunting task even if they existed.

Assume, for the sake of argument, that we now possess, for the top 50 conditions, procedures, or reasons for hospitalization, four quality measures for each, assessing different dimensions of quality—morbidity, mortality, functional status—across the wide range of outcomes that we would like to measure. For simplicity, let us limit the example to hospital care. Assume further that the measures are reliable and valid, and that we can produce them on a timely basis. What is the probability that a single hospital would rank at the top of the list for all 200 of these quality measures? The answer is nil. Quality varies across conditions, among hospitals and among providers. As a practical matter, then, if such a choice and selection process is going to happen, a consumer who is, say, pregnant with diabetes would select hospital A. Another, pregnant with hypertension, would choose hospital B. A patient seeking a hospital for laparoscopic removal of the gallbladder would choose hospital C, whereas a patient requiring an open cholecystectomy would opt for some place else.

In the real world, is it reasonable to expect consumers to make decisions in such a manner? Is it reasonable to expect health plans to contract with providers in such a fashion? If the answer, unlikely as it seems, is yes in either case, what happens when the next year's data are published and they are different? Do we expect plans and consumers to change their purchasing decisions with each new set of data? Would we want them to? The data will change, inevitably, if for no other reason than random variations in each measurement.

The likelihood of competition operating in the manner posited is low. That is not to say that competition is not a strong motivating force; indeed, if competition on quality could be induced and the power of that motivation could be used, we might, in fact, achieve quality improvement. Using the marketplace to induce competition on quality is as fraught with danger as it is unlikely to

occur. Marketplace competition on quality, at least as described heretofore, induces barriers to sharing best practices. For example, if hospital A competes with another one a few miles away and orthopedic surgeons at hospital A develop a way to reduce the length of stay after back surgery by 2 days, what is the incentive to share that best-practice information with the neighbor hospital when hospital A can negotiate a more favorable contract with the local HMO because it can offer them a better price for laminectomy?

Not only is there no incentive, there is a strong disincentive. Such information, in fact, may be regarded as proprietary marketing and strategic planning information, and so may be hoarded. In such a situation, competition bars the sharing of information on quality improvement and best practices.

Competition on quality might be an effective way to improve overall quality, but the marketplace may not be the best mechanism to effect that competition.

### *Use of an Integrated Approach*

Each of the strategies—regulation, professionalism, and competition—has some strengths and severe weaknesses. The optimal means for improving systemic quality, then, may be a blend that borrows from the strengths of each and tries to avoid some of the most problematic weaknesses. Such a blend has been employed by the New York State Department of Health for invasive cardiac procedures, notably cardiac surgery.

A regulatory framework surrounds this approach. A strict certificate-of-need program has regulated stringently, over the years, the number of hospitals that can do cardiac surgery. In New York only 31 hospitals perform cardiac surgery, compared with a state like California, which has no such program, where 116 hospitals perform cardiac surgery (Table I). California has about 70% more people than New York, but about 300% more hospitals performing cardiac surgery. Despite this regionalization, 82% of New Yorkers live within 25 miles of a hospital that performs cardiac surgery.

**TABLE I**  
CORONARY BYPASS SURGERY: A TALE OF TWO STATES, 1992

Capacity (No. of hospitals doing CABGs)
New York = 31
California = 116
Rate (per 100,000 adults)
New York = 134
California = 217

The number in California is only slightly higher, 91%.<sup>2</sup> The per capita rate of cardiac surgery is much lower in New York. It has been so for years.

The effect on quality is dramatic (Table II). Much research has documented the strong, inverse relationship between hospital volume and death rates following coronary bypass surgery.<sup>2</sup> Only 6% of New York hospitals do fewer than 200 cases a year, compared with 34% of California hospitals. Only 1% of patients who receive coronary bypass surgery in New York are operated on in very-low-volume hospitals, compared with 10%, or over 4,000 people, in California. Two-thirds of patients in New York benefit from being operated on at very-high-volume institutions, compared with less than half of people receiving this procedure in California. Quality is improved by decreasing the number of low-volume hospitals and concentrating this procedure in high-volume hospitals.

There is little inappropriate care in invasive cardiac procedures in New York (Table III). I believe that this outcome is related to regionalization, and researchers who studied this came to the same conclusion.<sup>3-5</sup> These data represent the lowest percentages of inappropriate care that have ever been published.

**TABLE II**  
CORONARY BYPASS SURGERY IN NEW YORK AND CALIFORNIA, 1992

Hospital Volume	Hospitals (%)		Cases (%)	
	NY	CA	NY	CA
500 or more	45	20	66	47
200-499	48	47	33	43
Less than 200	6	34	1	10

**TABLE III**  
OVERUSE IN NEW YORK

Type of Surgery	Percent of Overuse
Coronary bypass surgery:	2.4
Coronary angiography:	4.2
Percutaneous coronary angioplasty:	4.0

Regionalization has had a dramatic, positive influence on quality. This effect has been achieved through regulatory approaches. They are not fashionable, but they can be effective.

Alongside the regulatory framework exists a collaborative, voluntary effort to improve quality by decreasing mortality after cardiac surgery, specifically coronary bypass surgery. That aspect of the program is not regulatory; it is a quality improvement effort that involves oversight from a state-wide cardiac advisory committee that has had a series of distinguished chairs and is currently chaired by Dr. Kenneth Shine, President of the Institute of Medicine. The committee is composed of leaders in cardiology and cardiac surgery, generalist physicians and lay people from New York, and experts from other states. The committee has overseen the formulation of a prospective effort to collect information on risk factors and complications, from every hospital doing cardiac surgery on every patient who undergoes cardiac surgery in New York. Those data are analyzed by the Department of Health, using multivariate logistic regression to adjust for differences in severity and comorbidity among patients. Data on risk-adjusted, actual and expected mortality rates are then returned to hospitals so that, for the first time, they are able to determine how well they do compared with their peers, after the severity of patients' presenting illness and coexisting morbidities are taken into account.

The leadership of the cardiac advisory committee and the physician oversight have been absolutely essential to this process. The most unique aspect of this program, however, is what follows the feedback of data: a directed attempt to use the data to find opportunities to improve, institution by institution. The data also have led the state health department over the years to encourage, to persuade, to cajole, sometimes to coerce attention to the data.

**TABLE IV**  
CORONARY BYPASS SURGERY: RISK-ADJUSTMENT MODEL LOWEST-RISK  
GROUPS (1990 TO 1992)

Patient Population Number	Mortality Rate (%)	
	Actual	Expected
17,263	0.6	0.8
8,971	1.5	1.5
5,984	2.2	2.2
4,199	3.1	3.2
3,012	4.9	4.5

This process also includes an annual public release of mortality data that are specific to hospitals and, for the last several years, specific to physicians. That is the point in the process at which competition occurs, but it has not been the competition envisioned by the managed-competition theorists. It has not been a marketplace competition. In fact, patients have not moved away from high mortality hospitals or toward those with low death rates.

For example, hospitals that were identified in the first year of the program (1989) as having statistically elevated mortality served 8.7% of the patients receiving coronary bypass in 1989 and 9.1% in 1992. The low-mortality outliers served 15.7% in 1989 and 16.3% in 1992.<sup>6</sup> Similar results obtain in later years as well.

Instead of patient movement, competition induced by peer pressure has supervened. When a hospital is publicized as having the worst mortality in the state, not only do physicians and hospital administrators pay attention, but there also is a greater likelihood that the resources necessary to correct the problem will be forthcoming.

**TABLE V**  
CORONARY BYPASS SURGERY: RISK-ADJUSTMENT MODEL HIGHEST-RISK  
GROUPS (1990 TO 1992)

Patient Population Number	Mortality Rate (%)	
	Actual	Expected
2,153	7.1	6.2
1,492	9.7	9.0
980	14.3	13.7
584	21.2	23.0
280	43.2	48.1



**TABLE VI**  
CORONARY BYPASS OUTCOME IN NEW YORK

	Mortality Rate (%)			
	1989	1990	1991	1992
Actual	3.5	3.1	3.1	2.8
Expected	2.6	3.0	3.2	3.5
Risk-adjusted	4.2	3.3	3.0	2.4

Much discussion has ensued about the manner in which the risk factors are coded. There is an incentive for falsifying risk factors, but the bottom line (Tables IV and V) is how well the statistical model predicts mortality.<sup>7</sup> When the population of patients undergoing coronary bypass in New York (approximately 45,000 from 1990 to 1992) is evaluated by risk, there is no statistically significant difference between expected and actual mortality.

When the entire program is considered, the results are impressive (Table VI). There has been a drop in risk-adjusted mortality, a drop in actual mortality, and a rise in expected mortality. During a time when volume increased by 31%, from about 12,000 to 16,000 cases, risk-adjusted mortality fell by 41% in New York State.<sup>8</sup>

We do not have comparable data from other states, but a nationwide study of the Medicare population, in 1987 to 1990, showed an 18% drop in risk-adjusted mortality.<sup>9</sup> Improving surgical techniques and other factors have played a role in this drop, but I believe that New York State's program has also played a substantial role.

Various quality-improvement activities have been taken by hospitals that have analyzed these data. For example, one of the first

**TABLE VII**  
LOW-VOLUME SURGEONS WHO STOPPED PERFORMING CABGS IN NEW YORK

Year	Number Stopping	Risk-adjusted Mortality (%)		
		Last Year Operated	All Low-vol Surgeons	State Average
1989	6	21.6	7.9	4.2
1990	5	16.1	5.7	3.3
1991	10	7.7	3.6	3.0
1992	6	11.6	3.2	2.4

**TABLE VIII**  
TRACING POOR OUTCOMES TO PROCESSES: ST. PETER'S HOSPITAL

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High outlier in 1991 and 1992
Elective/urgent cases (91%) - average mortality
Emergency cases (9%) - 26% mortality (vs 7%)
Multidisciplinary review showed insufficient stabilization before surgery

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discoveries made by the program was that surgeons performing less than 50 cases a year had very high risk-adjusted mortality, compared to the state average, in every year we analyzed the data. Hospitals restricted privileges for such surgeons, in many cases not permitting them to do cardiac surgery after a period of monitoring. Over the 4 years for which we have data, 27 low-volume surgeons have stopped doing cardiac surgery in New York<sup>10</sup> (Table VII). They had a combined risk-adjusted mortality of 12% compared with the state average of 3% during that time.

Some hospitals found that individual surgeons, often not low-volume surgeons, had unsatisfactory results. Sometimes it turned out they were not trained principally in adult cardiac surgery. Some surgeons who divided their time between adult cardiac surgery and other fields such as pediatric cardiac surgery or vascular surgery had high risk-adjusted mortality, particularly for high-risk cases. Some such surgeons retired from the practice of adult cardiac surgery.

One of the most important things we can do with this information is to link outcomes with specific processes of care that we can manipulate to improve the outcome. That happened at St. Peter's Hospital in Albany, a large voluntary hospital that, in 1991 and 1992 was a statistically high outlier. In fact, in 1992 they were the only hospital with a statistically elevated mortality.

They did a standard morbidity and mortality review, as most surgical departments do, but could not find a quality problem. It was only when we started profiling the data that we found the origin of their problem: a very high mortality for a very small group of very-high-risk patients. The hospital's emergency bypass patients had a mortality of 26%, compared with the state average of 7% (Table VIII). A multidisciplinary review conducted by St. Peter's revealed that they had been going to surgery too quickly

**TABLE IX**  
IMPROVING PROCESSES IMPROVES OUTCOMES: ST. PETER'S HOSPITAL

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Team approach to stabilizing high-risk patients
Total mortality fell in 1993: 4.5% to 2.6%
Elective/urgent cases: 2.5% to 2.9%
High-risk cases not avoided
Emergency cases: number increased from 42 to 54; mortality fell from 26% to 0%

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with these patients.<sup>11</sup> They resolved that problem (Table IX). They did not avoid the high-risk patients—the hospital had more such patients in 1993 than in 1992—but, by taking more time to stabilize those patients, they were able to drop the mortality from 11 in 42 patients in 1992 to 0 of 54 patients in 1993.

This blend of regulation, competition, and professionalism has been effective in improving outcomes across the breadth of the delivery system for coronary bypass surgery in New York.<sup>7,8</sup> The principles that are illustrated here apply broadly to other procedures and conditions. In my opinion, a blended strategy such as this is probably the only way to galvanize an entire delivery system to achieve quality improvement.

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