My grandmother was the medicine woman in the small town in rural Mexico where I grew up. As I have gotten older, I have come to recognize the crucial role she played not only in instilling in me the value of healing but also in determining the fate and future of others. She was my first role model, and throughout my life I have depended on the help of my mentors in pursuing my dreams. Like many other illegal immigrants, I arrived in the United States able only to contemplate those dreams — I was not at that point on solid ground. From the fields of the San Joaquin Valley in California to the field of neurosurgery, it has been quite a journey. Today, as a neurosurgeon and researcher, I am taking part in the larger journey of medicine, both caring for patients and conducting clinical and translational research on brain cancer that I hope will lead to innovative ways of fighting devastating disease. And as a citizen of the United States, I am also participating in the great journey of this country. For immigrants like me, this voyage still means the pursuit of a better life — and the opportunity to give back to society.

An interview with Dr. Quiñones-Hinojosa can be heard at www.nejm.org.

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Pay for Performance, Version 2.0?

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"Old wine in a new bottle." "A financial gamble." "An early glimpse of the next generation of pay for performance." All these appraisals have been applied to Geisinger Health System's new approach to elective coronary-artery bypass grafting (CABG), which has been described with words rarely invoked in health care, such as "promise" and "guarantee." Geisinger, an integrated health care delivery system in northeastern Pennsylvania, promises that 40 key processes will be completed for every patient who undergoes elective CABG — even though several of the "benchmarks" are to be reached before or after hospitalization. And although Geisinger cannot guarantee good clinical outcomes, it charges a standard flat rate that covers care for related complications during the 90 days after surgery.

As a member of Geisinger's board of directors, I have watched this program evolve over the past year, and I see truth in all three of the above assessments. Many of the core components of the program are familiar, but this sort of application of those components represents a foray into the unknown. Since a front-page article in the *New York Times* on May 17, 2007, drew national attention to the Geisinger program, other hospitals have been watching closely and wondering whether they, too, should go down this road. Those who examine it closely will quickly discover that the program is less about cardiac surgery than about the search for an alternative to traditional fee-for-service care.

The basic concept is far from radical. The seven cardiac surgeons in the Geisinger delivery system agreed on 40 processes that should be completed during the care of every patient undergoing elective CABG. Most of the "Proven Care Benchmarks" come directly from guidelines established by the American College of Cardiology and the American Heart Association (ACC–AHA) (see box). These steps (such as the administration of preoperative antibiotics at a specified time) are prominent in the critical pathways in use for cardiac surgery at many other hospitals.

The list does not force the surgeons to practice "cookbook medicine." For example, they do not necessarily have to use epiaortic echocardiography to screen for atheromata before manipulating the aorta. But the protocol requires that they consider this test and document the reason if they decide not to use it.

Closer inspection reveals some other items on the list that would be new to most critical pathways for CABG. The first benchmark that must be documented is a statement of the indication for CABG according to the ACC–AHA guidelines.[1] These guidelines de-

Selected Key Processes in the Geisinger "Proven Care" Elective CABG Program.*

Preadmission documentation
American College of Cardiology–American Heart Association indication for surgery
Explanation of treatment options to patient
Indication of whether patient is a current user of clopidogrel or warfarin
Screening for stroke risk
Screening for use of epiaortic echocardiography
Operative documentation
Patient receives correct dose of beta-blocker
Patient receives preoperative antibiotics (within 60 minutes of incision; with vancomycin within 120 minutes)
Left internal thoracic artery is used for grafting of the left anterior descending artery
Postoperative documentation
Antibiotics are administered (postoperatively, for 24 to 48 hours)
Beta-blocker is administered (within 24 hours after surgery)
Tobacco screening and counseling are provided
Discharge documentation
Referral to cardiac rehabilitation is provided
Discharge medications (aspirin, beta-blockers, statin) are prescribed
Postdischarge documentation
Patient is taking medications correctly
Patient has or has not resumed smoking
Patient is enrolled in cardiac rehabilitation

* CABG denotes coronary-artery bypass grafting.

scribe 22 class I indications, for which there is strong evidence in support of the appropriateness of CABG. At the other end of the spectrum are 9 class III indications, for which the evidence actually argues against performing surgery. In between are 11 class IIa indications, for which the evidence generally favors the use of CABG, and 3 class IIb indications, for which there is less support.

The surgeons can proceed directly to surgery if the patient has a class I or IIa indication. However, if the strongest indication for surgery is class IIb, the case must be reviewed by a colleague. For patients with class III indications only, surgery is not an option.

Another preadmission benchmark is documentation that the surgeon has reviewed the treatment options and their risks and benefits with the patient and that the patient prefers the surgical approach. Completion of this step, along with the appropriateness assessment, provides assurance that the patient both desires and needs the operation.

A third innovation is the requirement of postdischarge follow-up to ensure that patients are taking their medications correctly, participating in a rehabilitation program, and (one hopes) refraining from smoking. In between these preadmission and postdischarge steps, the Geisinger program looks very much like other CABG critical pathways.

Of course, one key difference is that Geisinger guarantees that all 40 benchmarks will be achieved for every elective CABG. Delivering on that guarantee turned out to be easier said than done. After the Geisinger surgeons agreed on the benchmarks in the spring of 2006, they looked at a series of cases and found that slightly more than half of patients were going through every one of the processes. The surgical teams began creating systems to ensure that all 40 processes would be completed, without disrupting the flow of care. Within a few months, 100% of patients were hitting 100% of the benchmarks. Today, if any of the preoperative benchmarks are overlooked, surgery is delayed until the unfinished task has been completed.

Thus far, the Geisinger program sounds like a no-nonsense critical pathway with some extra bells and whistles — but now we get to the risky part. For patients who have surgery as part of this program, Geisinger will not charge for related care within 90 days. For example, there are no additional charges for treatment of sternal wound infections or heart failure due to a perioperative infarction, as long as patients receive their care at a Geisinger facility. On the other hand, the usual charges would apply to care for preexisting heart failure or unrelated problems, such as diverticulitis or a hip fracture.

To calculate the case rate for CABG, Geisinger examined its historical costs for related care during the first 90 days after surgery — and then set itself a target of reducing those costs by

half. Geisinger has some encouraging early data suggesting that its complication rates may have decreased since the program was introduced. But the numbers are small, and no one knows for sure whether this approach will really reduce complication rates or lower postdischarge costs by anything approaching 50%.

This uncertainty explains why most chief financial officers get nervous when they hear about Geisinger's program. They point out that Geisinger is a unique organization. It has its own insurance company, and its physicians are salaried employees of the Geisinger Health System. It has a spectacular management information system that records and guides most aspects of both inpatient and outpatient care. And it has a tradition of innovation and collaboration that makes it easier to get physicians to participate in a program like this one.

On the basis of my interactions with Geisinger's physicians, I would say they are pretty much like the doctors I know everywhere — willing to agree to things that will improve patient care but in no particular hurry to compromise their professional autonomy. I also know that Geisinger's financial leaders (and its board) do not like uncertainty any more than those of other organizations.

But the fact is that elective CABG is not a common procedure in the era of statins, beta-blockers, aspirin therapy, and angioplasty. If the revenue from CABG performed at the case rate is too low to cover costs, Geisinger will be able to adjust its prices upward without causing too much damage. So the gamble, though real, is not huge. And the experience gained by learning how clinicians need to collaborate to succeed within this framework seems worth the risk.

The real question for Geisinger and for the rest of the health care system is whether this case-rate approach might emerge as a new form of pay for performance. Many current models of pay for performance (involving, for example, quality-of-care measures for patients with diabetes) focus on populations of patients whose care is managed by primary care physicians. For most specialists and hospitals, existing incentive systems put only a modest amount of revenue at stake, and as would be expected, resulting changes in care have been modest as well.

But the drumbeat is growing stronger for health care financing models that go beyond rewarding volume alone. Case rates and critical pathways are not foreign concepts at many hospitals — they just have not been married so explicitly before. Geisinger is actively working to extend this approach to other surgical procedures, and diseases treated on an outpatient basis, such as diabetes and hypertension, could be next. A reasonable guess is that models that work for organized delivery systems such as Geisinger will spread over time to the rest of U.S. health care. So this experiment bears watching.

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1. Eagle KA, Guyton RA, Davidoff R, et al. ACC/AHA 2004 guideline update for coronary artery bypass graft surgery: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Update the 1999 Guidelines for Coronary Artery Bypass Graft Surgery). Washington, DC: American College of Cardiology, 2004. (Accessed July 19, 2007, at http://www.acc.org/qualityandscience/clinical/guidelines/cabg/index.pdf.)