

Researchers crack code for 'personalizing' costs to transform delivery of care

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Providing the best care at the lowest cost has become one of the mantras of health care reform. While measuring quality in health care is understandably complex, surprisingly, the true cost of caring for individual patients has been nearly impossible to pin down, too.

With the help of new "big data" tools, UPMC's financial and clinical experts have begun to crack the cost code for more than 260,000 hospital patients and 4 million outpatient visits annually. The implications for patients, clinicians and UPMC are sweeping—from better understanding of where and why variations in patient care are occurring to figuring out where best to invest limited capital. Until now, these decisions were based on industrywide cost estimates that often bore little resemblance to reality.

"Health care is moving from volume-based to value-based models of care. To adapt to these sweeping changes, it's imperative that we understand and measure not only the quality and outcomes of the care that we are delivering, but the true costs of that care across the patient's entire experience at UPMC," says UPMC Chief Financial Officer Robert DeMichiei.

Many kinds of so-called "activity-based" costing techniques have been used for decades in manufacturing and other industries, he notes, but have been difficult to apply in the more complex world of health care, where treatments and the care setting must be tailored to the needs of each patient. "Bringing together activity-based cost and quality

measurement is a game changer in health care," said Mr. DeMichiei. "It will allow us to consistently maximize outcomes for our patients while using precious [health care resources](#) most effectively."

UPMC's new activity-based costing system, piloted last year at UPMC Mercy and UPMC Presbyterian, retrieves and aggregates relevant clinical, operational and financial information from multiple information systems at UPMC. Sophisticated computer modeling tools, along with internally developed algorithms, allow UPMC's [financial analysts](#) to match supplies, blood products, equipment use and more than 50 clinical activities—such as time in the operating room, [intensive care unit](#) or rehabilitation facility—to specific patients. In the past, because of the limited ability to systematically share, store and analyze data, general formulas were applied to account for costs, sometimes leading to imprecise conclusions about specific treatments, service lines or facilities.

Ultimately, this cost management system—to be rolled out systemwide over the next year and one of the first in the country—will be married to UPMC's recently implemented data analytics platform, allowing financial analysts and clinicians to quickly see patterns and ask questions that were not easily recognized before. For instance, if either a robotic or laparoscopic surgical procedure produces equivalent patient outcomes, which one is lower cost? Is a certain type of surgery performed more effectively in a hospital or an outpatient setting? If one physician appears to have higher costs than his peers for the same type of surgery, is he getting better results and why?

"We will always do what's right for our patients—but now we have a better way of figuring out what is right in terms of producing the highest-quality, most cost-effective care," says Steven Shapiro, M.D., chief medical and scientific officer. "The health of our patients—and, indeed, the economic health of our country—are at stake."

Physicians have played a key role in building the new system, both in assessing the clinical variables used and the analyses that have resulted. Hospital costs can be viewed in multiple ways: by patient, by physician, by facility, by diagnosis and episode of care. "UPMC's physicians are on the cutting-edge of research and medicine. Now we are playing a leading role in shaping the way that big data, including cost data, will drive evidence-based medicine," said Dr. Shapiro.

UPMC's earliest efforts to create a more transparent and accurate method of cost management started in 2002 in Italy, where UPMC operates ISMETT, one of the country's leading transplant centers. Even without the latest computer tools, financial analysts and clinicians there created some of the methods that have been exported to Pittsburgh's cost management system. "Working under a different payment model in Italy, where fee-for-service is not the norm, our partners were able to get a headstart on the cost management methods that will transform U.S. [health care](#)," said Mr. DeMichiei. "As an industry, we must deliver high-quality care in a smarter way."

Provided by University of Pittsburgh

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