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COVER STORY

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empowering clinicians to become stewards

At Texas hospitals, care providers are receiving transparency into real-time cost, and patient risk, allowing them to play a leading role in ensuring their organizations deliver high-quality care with a focus on value above volume.

Healthcare providers have a natural inclination when faced with a patient who is injured or ill to take specific action. But the procedures, tests, and medications providers use often pose risks of complications, side effects, or findings that could lead them down clinical paths that deliver no value. And if several providers are each doing multiple things for the same patient at the same

time, these risks multiply—adding to what could be called the “human cost” of care. Healthcare providers should understand that *more* is not always *better* in medicine.

Meanwhile, patients not only bear the impact of this human cost, but also now bear responsibility for an increasingly large portion of healthcare expenses through elements such as higher deductibles, copayments, and coinsurance. A serious health episode can erode savings and cause some patients to forgo necessities.

For providers, acknowledging these realities means embracing the premise that *caring about* patients means being good stewards while *caring for* patients.

Uncovering the Human and Economic Costs of Care

Through the leadership of the Texas Hospital Association, several health systems in Texas are empowering their physicians by giving them a real-time view of the human and economic cost of their care. Results across many different hospitals indicate that this transparency does promote a spirit of stewardship among physicians. But success requires more than just displaying an

AT A GLANCE

- > An initiative involving Texas hospitals aimed to provide physicians with transparency into costs and risks associated with their treatment decisions.
- > A key goal for the initiative was to promote a spirit of stewardship among physicians, by which they would lead the way toward achieving the goals of value-based care.
- > The initiative’s designers identified three factors that were critical to its success: getting providers into an efficiency mindset, unobtrusively educating providers about stewardship opportunities, and providing administrative reinforcement.

isolated cost or metric. It requires providing physicians with clear insight into two key factors.

The financial burden on patients from their care.

In 2017, the average annual premium for employer-sponsored health insurance was \$18,764 for family coverage—an increase of 19 percent since 2012, and 55 percent since 2007.^a The average increases in premiums for the lowest-cost bronze, silver, and gold health plans in the Affordable Care Act’s health insurance marketplaces for 2018 were 17 percent, 32 percent, and 18 percent, respectively.^b

As premiums have risen, so too have deductibles and copayments, forcing patients to bear a greater financial burden to receive essential health care. The number of adults on a high-deductible health plan has risen almost 50 percent since 2011, according to a recent poll conducted by the Kaiser Family Foundation.^c Forty-three percent of adults with health insurance say they have difficulty affording their deductibles.^d Three in 10 Americans report problems paying medical bills, and among them, 73 percent report cutting back spending on food, clothing, or basic household items to be able to cover their healthcare costs.

The relationship between spending and quality. It has been widely shown that higher utilization and more spending do not equate to better outcomes.

As long ago as 2003, Dartmouth researchers who analyzed regional variations in Medicare spending found, “Patients in higher-spending regions received approximately 60 percent more care... [but] neither quality of care nor access to care appear to be better for Medicare enrollees in higher-spending regions.”^e

This finding is in line with other analyses of national variation. Healthcare spending averaged \$9,892 per person in the United States in 2016, almost 2.5 times the average for the other 36 countries in the Organisation for Economic Co-operation and Development (OECD), and 25 percent higher than that of Switzerland, the next highest spender (adjusted for local living standards). Compared with other G7 countries, the United States spends almost 80 percent more than Germany and more than twice as much on health care per person as Canada, France, and Japan. Yet life expectancy in the United States has declined relative to other nations: In 1970, it was one year above the OECD average, but it has fallen to almost two years below the average.^f

As recently as 2017, a Harvard School of Public Health analysis of 485,016 hospitalizations treated by 21,963 physicians at 2,837 acute care hospitals found considerable variation in spending across different hospitals and even more variation among physicians within the same hospital.^g It concluded, “Higher physician spending is not associated with better outcomes of hospitalized patients.”

a. Claxton, G., Rae, M., Long, M., and Damico, A., *Employer Health Benefits: 2017 Survey*, The Kaiser Family Foundation and Health Research & Educational Trust, 2017.

b. Semaskee, A., Claxton, G., and Levitt, L., “How Premiums Are Changing in 2018,” Kaiser Family Foundation, Updated Nov. 29, 2017.

c. Cohen, R.A., and Zammiti, E.P., *High-Deductible Health Plans and Financial Barriers to Medical Care: Early Release of Estimates from the National Health Interview Survey, 2016*, National Center for Health Statistics, June 2017.

d. DiJulio, B., Kirzinger, A., Wu, B., and Brodie, M., *Data Note: Americans’ Challenges with Health Care Costs*, Kaiser Family Foundation, March 2, 2017. <https://www.kff.org/health-costs/poll-finding/data-note-americans-challenges-with-health-care-costs/>

e. Fisher, E., Wennberg, D., Stukel, T., Gottlieb, D.J., Lucas, F.L., and Pinder, E.L., “The Implications of Regional Variations in Medicare Spending. Part 1: The Content, Quality, and Accessibility of Care,” *Annals of Internal Medicine*, Feb. 18, 2003.

f. OECD, “How Does the United States Compare?” *Health at a Glance 2017: OECD Indicators*, 2017.

g. Tsugawa, Y., Jha, A., K., Newhouse, J.P., Zaslavsky, A.M., Jena, A.B., “Variation in Physician Spending and Association with Patient Outcomes,” *JAMA Internal Medicine*, May 1, 2017.

Being clinically efficient does not come at the expense of quality. In fact, it lowers the risk of medical errors and problems introduced as a result of care decisions made by one or more providers, while also lessening the financial burden on patients.

Consequences of Uninformed Care

The experience of one physician highlights the underlying issues. In 2014, Mukul Mehra, MD, a gastroenterologist, served as the third consultant for a 36-year-old patient with Crohn's disease. Taking extra time to study the patient's complete records, Mehra noted that she had received 18 computed tomography (CT) scans in the prior three years. Having a background in physics, Mehra knew medical radiation was potentially harmful, but he was unable to find any source where that harm was calculated and presented in real terms for him to consider.

To determine the effects, Mehra spent four hours computing the cumulative radiation from the patient's imaging studies. The results were disturbing: He found that the patient had absorbed more than double the radiation dose a person would have absorbed standing one mile from the atomic bomb blast at Hiroshima. The physicians involved in this patient's case never considered that their imaging orders could harm this patient, nor did the patient understand the extent of her radiation exposure.

Mehra wrote on the back of his business card the estimated effective radiation dose and the potential incremental cancer risk to the patient and told her, "I'm not saying you will never need another CT, but if another physician orders one, just show them this card and have them call me if they need more detail about these numbers." In the years since, she has not had another CT. This and other anecdotal experiences caused Mehra to conclude that physicians would be more

thoughtful about their care decisions if they were more aware of the human and economic consequences of those decisions.

Clinician Stewardship: Untapped Potential

Physicians are largely unaware of the costs of their care. One study found that physicians estimated the costs of prescription drugs correctly less than half of the time.^h Another study found that none of 189 emergency physicians was able to estimate at least 50 percent of costs within 25 percent of Medicare payment.ⁱ Further, reports have concluded that, although physicians should consider cost in their decision making, they have a limited knowledge of cost estimates, and a medical provider's level of experience or seniority has no effect on the provider's ability to accurately estimate cost.^j

The idea that cost transparency could influence the utilization of medications, labs, and radiology tests (provider-controlled items on which they exercise judgment in ordering) was supported by prior studies. When physicians were shown drug costs, they ordered therapeutically equivalent, less-expensive medications.^k Displaying costs of lab exams prompted a 10.1 percent reduction in

h. Codgill, B., and Nappi, J.M., "Assessment of Prescribers' Knowledge of the Cost of Medications," *Annals of Pharmacotherapy*, February 2012.

i. Broadwater-Hollifield, C., Gren, L., Porucznik, C., Youndquist, S.T., Sundwall, D.N., and Madsen, T.E., "Emergency Physician Knowledge of Reimbursement Rates Associated with Emergency Medical Care," *The American Journal of Emergency Medicine*, June 2014.

j. See Rock, T.A., Xiao, R., and Fieldston, E., "General Pediatric Attending Physicians' and Residents' Knowledge of Inpatient Hospital Finances," *Pediatrics*, June 2013; and Allan, G.M., and Innes, G.D., "Do Family Physicians Know the Costs of Medical Care? Survey in British Columbia," *Canadian Family Physician*, February 2004, pp. 263-270.

k. Hart, J., Salman, H., Bergman, M., Neuman, V., Rudniki, C., Gilenberg, D., and Djaldette, M. "Do Drug Costs Affect Physicians' Prescription Decisions?" *Journal of Internal Medicine*, May 1997.

lab costs.^l And displaying a price list of the 39 most common radiological tests led to a roughly 21 percent reduction in radiology costs.^m

A 2016 survey of 600 physicians by Deloitte found that cost data are the third most useful type of data physicians receive (behind clinical outcomes and patient experience), yet are the least available out of all seven types of data they receive about their care patterns.ⁿ

The cost data also must be detailed. Results of more recent work at the University of Pennsylvania's Perelman School of Medicine indicate that just showing a cost during the ordering process is not enough to change behavior.^o The researchers found that displaying the cost of laboratory tests in electronic health records (EHRs) during the ordering process had no effect on decreasing lab utilization. They concluded, "Our findings indicate that price transparency alone was not enough to change clinician behavior and that future price transparency interventions may need to be better targeted, framed, or combined with other approaches to be more successful."

A Method for Providing Cost and Risk Transparency

To address the issue of cost and risk transparency for physicians, and enable physicians to become better stewards of patient care, Mehra and his colleagues, with feedback from the Texas Hospital Association and participating Texas hospitals,

developed an EHR-agnostic "ribbon" of information that can be overlaid on an EHR as a means to inform providers of the cumulative human and economic cost of their inpatient care. The objective for the tool was to synthesize both economic costs and patient risks to enable providers to better understand the consequences of their decisions. Mehra and his colleagues designed the ribbon using existing data feeds and user authentication infrastructure, thereby lowering the technical burden of implementation.

The ribbon was initially applied to inpatient care, because spending on hospital care services remains the single largest portion of U.S. healthcare spending. A recent analysis found that spending on hospital care constituted 32 percent of total healthcare spending in 2016—a figure unchanged since 2013.^p

The ribbon displays the cost of medications (by cost per day of scheduled orders) and lower-cost and dose-equivalent alternatives (if applicable and on formulary), and it informs the provider of the increased risk of *Clostridium difficile* from antibiotics and proton pump inhibitors, the risk of adverse drug reactions from polypharmacy, the excess risk of falls due to sedatives and opioids, and most recently, the risk of long-term opioid use based on inpatient morphine-equivalent dose exposure.

It not only displays the cost of lab tests, but also tracks lab timing intervals (to discourage repeated labs within time frames that are not clinically useful), phlebotomy-associated blood loss, and the associated anemia risk. It also displays the cost of imaging, reveals cumulative

l. Feldman, L., Shihab, H., Thiemann, D., Yeh, H.C., Ardolino, M., Mandell, S., Brotman, D.J., "Impact of Providing Fee Data on Laboratory Test Ordering: A Controlled Clinical Trial," *JAMA Internal Medicine*, May 27, 2013.

m. Schilling, U., "Cutting Costs: the Impact of Price Lists on the Cost Development at the Emergency Department," *European Journal of Emergency Medicine*, December 2010.

n. Morris, M., Abrams, K., Elsner, N., Gerhardt, W., *Practicing Value-Based Care: What Do Doctors Need?*, Deloitte Insights, Oct. 20, 2016.

o. Penn Medicine, "Displaying Lab Test Costs in Electronic Health Records Doesn't Deter Doctors from Ordering Them," News Release, April 21, 2017.

p. Hartmean, M., Martin, A.B., Espinosa, N., Catlin, A., and The National Healthcare Expenditure Accounts Teams, "National Health Care Spending in 2016: Spending and Enrollment Growth Slow After Initial Coverage Expansions," *Health Affairs*, Dec. 16, 2016.

medical radiation exposure across patient encounters, and estimates the associated cancer risk based on patient-specific factors to frame physics metrics in human terms.

In all cases, *cost* means the wholesale supply cost to produce the item, not the charges to the patient. Often *charges* bear no relationship to the cost of producing or supplying a specific medication or test.^q Although physicians may not need accuracy to the penny to make value-based judgments, they should be able to view any costs presented as being real costs. Nebulous symbols and graphics are less influential because physician decisions tend to be metrically driven.

Success Factors

Through their collective work in engaging physicians regarding stewardship, the initiative's designers identified three key factors that were critical to its success.

Getting providers to adopt an efficiency mindset.

In getting physicians on board with the use of the ribbon and its objectives, displaying the cost of any one item was far less effective than showing cumulative cost and iatrogenic risks (i.e., risks from medical errors, overprescribing, and multiple physicians prescribing treatments that are at odds with each other). For example, the marginal cost of running a basic metabolic panel (BMP) is fairly low. But when an ordering physician sees a patient who has had 24 BMPs with 125 ml of phlebotomy-related blood loss, which has increased the patient's risk of anemia by 22 percent, the physician will realize that every lab is part of a cumulative effect, and it may make the physician think twice about habitually ordering a daily BMP.

Educating providers unobtrusively about stewardship opportunities.

The hospitals already use clinical decision support to interrupt the ordering workflow to encourage pathways that are focused on both high value and high safety. But there is a limit to the number of times a provider's workflow should be interrupted, and there are literally thousands of unique stewardship opportunities. Preserving some physician autonomy is beneficial, because at a national level, physician morale and satisfaction are at a low point. The ribbon is designed to highlight stewardship opportunities at the time and place when they are most relevant and potentially actionable. It is still up to the provider to decide what is most appropriate in any situation, but providers can't make informed value judgments if they are unaware of cost, which is an important component of value.

Providing administrative reinforcement. Participating hospitals also must commit to ensuring such an initiative has support from clinical leadership to effectively promote the successful execution of the initiative. Hospitals with the best outcomes have clinical leaders (e.g., chief medical officers, chief medical information officers, heads of hospitalist programs, etc.) who encourage a culture of stewardship.

Measurement of Use and Impact

Many hospitals have cost accounting systems that separately account for direct costs of medications, labs, and radiology exams per inpatient admission. These systems can be leveraged to measure changes in cost per admission over time as a result of such an initiative.

However, comparison of cost over different time periods always must be risk-adjusted for severity of illness. Seasonal and other factors may cause increasing or decreasing costs at a macro level that do not reflect real changes in stewardship at the micro level. To account for these factors,

q. Arora, V., Moriates, C., Shah, N., "The Challenge of Understanding Health Care Costs and Charges," *AMA Journal of Ethics*, November 2015.

hospitals participating in the Texas initiative have used a DRG risk-adjustment methodology to compare their performance with that of the other participants over time.

Hospitals participating in the initiative range from large public hospitals and academic medical centers to for-profit community hospitals to small rural hospitals. In all, the initiative's leaders have measured both providers' interaction with the ribbon and changes in ordering and spending.

The ribbon also has a "mute" feature for providers who do not want to view it on their EHR screens. Nearly all participating hospitals provide access to every credentialed provider. More than half (56 percent) of providers allow the ribbon to appear on their screens, and 20 percent of providers interact with it (looking at lower cost alternatives, for example) on any given day.

Across all hospital admissions, on a DRG-adjusted basis, the initiative's designers have observed a \$170.16-per-admission decrease, on average, in the cost of inpatient medications, labs, and radiology tests. They also have noted a 14.2 percent average reduction of inpatient medication costs, a 14.3 percent reduction in inpatient lab costs, and a 5.6 percent reduction in inpatient radiology costs per hospital. Collectively, these hospitals represent 143,338 annual inpatient admissions. No negative effects on mortality, readmissions, or length of stay have been observed.

In addition to measuring macro-level changes, the Texas hospital leaders now know the cost of every order for a medication, a lab test, or a radiology exam by provider, the subspecialty of the provider giving the order, and the DRG of the patient admission. They also are beginning the process of making those data readily available to

each physician, enabling the physician to compare his or her performance with that of peers in the same specialty.

Using the ribbon also makes the physicians aware of specific medications, lab tests, or radiology exams they tend to over-order relative to their peers, and for which specific diseases. The initiative leaders believe exposing providers to the variation in care and cost among all providers in their subspecialties in their own hospitals or health systems will make them more mindful of variation and aware of the specific opportunities they can apply to their own practice patterns.

The more granular and credible the information, the greater the likelihood that a physician will respond to the information. Correct attribution is ensured because the providers' data are based on the orders they enter into the EHR. Often, existing dashboards and third-party data do not provide enough detail to inform physicians' choices and actions.

What's Next

An additional 26 Texas hospitals have joined the initiative in 2018. Further, the Georgia Hospital Association has recently announced a similar initiative, with other states looking to follow suit.

At the Texas hospitals, the technology is transforming the EHR workflow. The goal is for providers soon to be able to individually curate their stewardship opportunities. The platform also is being expanded to allow visibility into opioid exposure in both the inpatient and outpatient settings through the inclusion of state Prescription Monitoring Program databases. Moreover, the hospitals have begun displaying care gaps, coding gaps, antimicrobial stewardship data, and information about patient copayments for outpatient medications.

Patients rely on their care providers to guide them regarding what is in their best interest. They may mistakenly perceive that providers who prescribe more tests are being more thorough. Unfortunately, the patient does not understand the meaning of iatrogenic risk or a therapeutic cascade (i.e., when a complication, side effect, or false-positive abnormal test result leads to use of another medicine, test, or procedure, which causes an adverse reaction that must be treated with yet more medications or another procedure). It is the provider who has the expertise to make judgments regarding the value of care, but he or she can do so only if empowered with the knowledge and culture of clinical stewardship. ■

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