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# a data-driven approach to improving clinical care and reducing costs

The experiences of an academic health center and a hospital system in applying data analytics provide valuable lessons for other organizations that are just beginning such efforts, which are critically important for success under value-based payment.

## AT A GLANCE

- > UTMB Health, in Galveston, Texas, and Franciscan Alliance, based in Mishawaka, Ind., are pioneering the use of data analytics to support clinical-improvement efforts.
- > UTMB Health's data analytical efforts focused on analyzing root causes of high complications and readmission rates.
- > Franciscan Alliance engaged physicians by identifying best-performing colleagues with best practices that could raise overall physician performance.

Advanced data analytics have become imperative in today's value-focused environment as healthcare leaders work to position their organizations to succeed under evolving risk-based payment arrangements. Healthcare providers must have infrastructure and tools to be able to examine the growing wealth of data and identify key insights that will drive high-value care—i.e., high-quality, lower-cost, patient-centric care—under Medicare, Medicaid, and commercial payment arrangements.

Many healthcare organizations already are addressing cost-improvement opportunities in the supply chain and other nonclinical areas. The next critical cost-reduction phase involves taking an in-depth look at clinical care, using data analytics to sustainably improve patient outcomes and efficiencies. Healthcare finance leaders can gain valuable insight from organizations that are at the forefront of such efforts.

Here, we describe the experiences of two health systems—UTMB Health, in Galveston, Texas, and Franciscan Alliance, based in Mishawaka, Ind.—that are pioneering the use of data analytics to support clinical-improvement

efforts. Each of these organizations has been able to prioritize improvement initiatives by using analytics to identify unwarranted variations in care and to pinpoint specific gaps between the desired best practices and current practices.

### **UTMB Health: Uncovering Root Causes of High Preventable Complication and Readmission Rates**

Leaders at UTMB Health use benchmark data and analytics to guide improvement efforts. The academic health center (AHC) was prompted to obtain its data when learning of penalties by the state's Medicaid program.

In 2011, Texas began reducing Medicaid payments to hospitals with higher-than-expected rates of potentially preventable readmissions. Then, in October 2014, the state added a pay-for-performance penalty for potentially preventable complications. UTMB leaders had anticipated readmission-related payment reductions. But they did not expect to incur a penalty for a high complications rate, amounting to 2.5 percent of Medicaid payments. Together, the readmission and complication penalties added up to millions of dollars over two years, reflecting a 3.5 percent payment reduction.

After obtaining the AHC's raw Medicaid data from the state, UTMB staff sorted the data by DRG and found that obstetrical patients accounted for most readmissions and complications. A multidisciplinary team of obstetricians, nurses, quality management staff, and coders was assembled to investigate, including UTMB's chief of obstetrics and maternal fetal medicine, who led the physician group, and the then-chief quality, safety, and clinical information officer, who led the interdisciplinary team.

Additional analyses of ICD-9 and ICD-10 complication codes in the Medicaid data using a Pareto analysis approach disclosed two frequently cited obstetrical complications: severe vaginal lacerations (i.e., third- and fourth-degree tears) and hemorrhage (i.e., excessive bleeding) after childbirth. The hospital could make the most

significant impact by reducing these two complications.

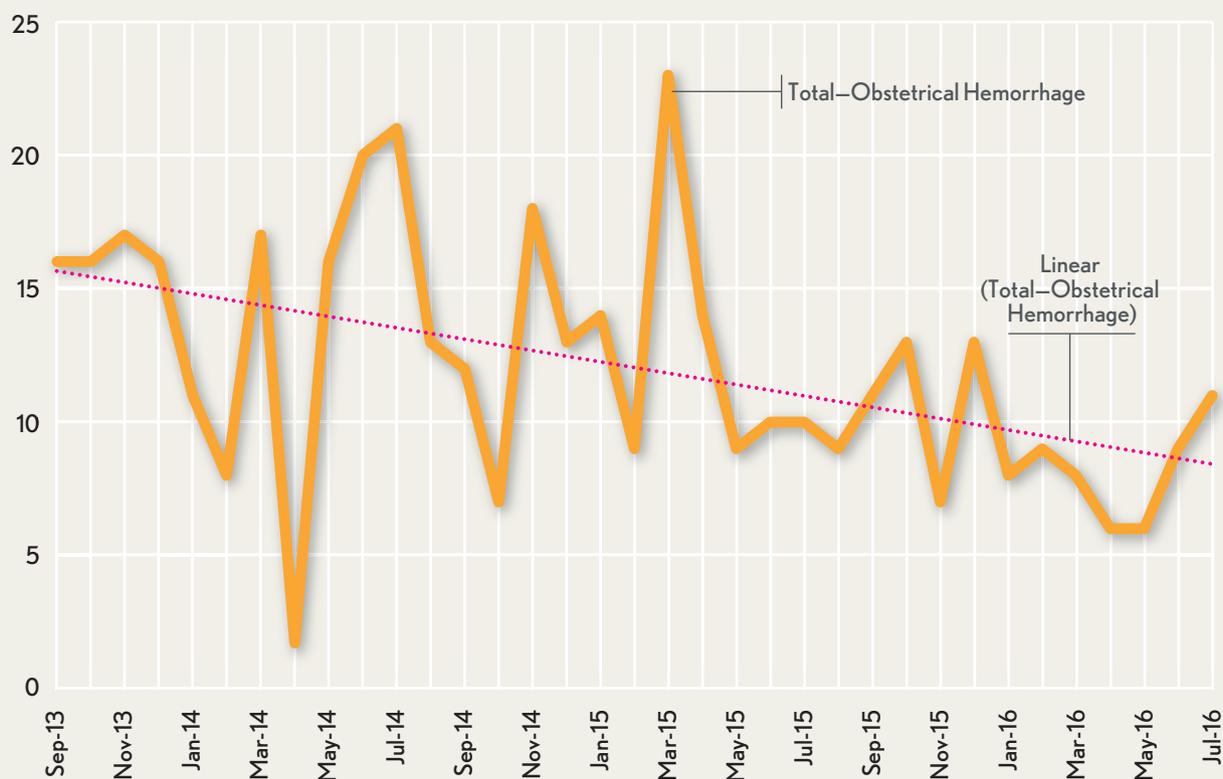
Team members reviewed more than 60 charts for cases in which complications had occurred. In most instances, documentation and coding did not reflect the patients' true conditions. For instance, patients with normal bleeding after vaginal deliveries were being incorrectly coded as *hemorrhaging*, which was defined as one of the potentially preventable medical complications subject to penalties. Moreover, many charts did not document comorbidities present on admission, such as diabetes or poor nutritional status, both of which conditions raise the risk of birth complications. Because the Texas Medicaid algorithm accounts for such risk factors, these types of cases are excluded from penalties.

The team concluded that UTMB had a documentation and coding problem, not a patient safety issue. To address this problem, the physician group leader endorsed a clinical documentation improvement effort, educating physicians, residents, and nurses to be more specific in their documentation to ensure coders could determine the proper codes. In addition, decision tools were added to the electronic health record (EHR) to make it easier for clinicians to provide documentation details. These actions enabled UTMB to reduce Medicaid payment penalties related to potentially preventable complications to zero. The exhibit on page 3 shows the decline in average obstetrical hemorrhage rate.

Following a similar approach, UTMB also reduced Medicaid readmission penalties to zero. Data analysis confirmed a misclassification problem: Most readmitted mothers stayed in the hospital for only 24 to 36 hours and could be reclassified as observation patients instead of inpatient admissions.

A sophisticated data analytics report is now helping UTMB further lower obstetrical complication and readmission rates. Rather than waiting to analyze year-old state Medicaid data, UTMB staff now know, as soon as each case is coded,

## OBSTETRICAL HEMORRHAGE RATE



Source: UTMB Health. Used with permission.

when patients experience a potentially preventable complication or readmission, as defined by the state. Mining the data for specific codes most often associated with potentially preventable complications, the tool flags only those cases that are worthy of UTMB's attention. This enabled the team to implement a real-time documentation review process. Interventions to reduce penalties for complications include timely feedback to coders and documenting providers by the physician leader, and education and communication regarding documentation and clinical definitions, such as degrees of laceration and how much bleeding constitutes a hemorrhage.

### Franciscan Alliance: Identifying Best-Performing Physicians to Engage Other Physicians

Using robust benchmarks, advanced analytics tools, and statistical methods, the 14-hospital Franciscan Alliance has rich data and resources to support improvement efforts. The hospital system manages and applies the information to assess performance against benchmarks and analyze variation on multiple dimensions to identify, in a balanced way, a group of physicians who are able to achieve the best outcomes.

For instance, the health system can stratify physician-level performance and identify those physicians who consistently perform above or below benchmark levels. Franciscan Alliance assembled a team to focus on a high-risk, large-volume diagnosis, such as heart failure

FEATURE STORY

(MS-DRGs 291, 292, and 293). The team included Franciscan’s decision support leader, who has oversight of analytics with finance, and a physician leader, who provides oversight of clinical analyses. The team was able to identify the best-performing physicians by assessing four key metrics—lengths of stay (LOS), readmissions, risk-adjusted mortality rates, and adjusted direct costs—over a two-year period against national Medicare and system-developed benchmarks.

First, the team looked at LOS performance for all attending physicians who saw at least 10 or more patients during the performance period, the initial focus being to ascertain whether the physicians were performing significantly better or lower than the benchmark. The team’s finding at one hospital was that the performance of most

attending physicians was at the benchmark level (see the exhibit below). However, one physician’s performance was above the benchmark and three physicians’ performance fell short of the benchmark.

The team further stratified performance based on readmission rate, mortality rate, and direct cost to determine the overall best and lowest performers.

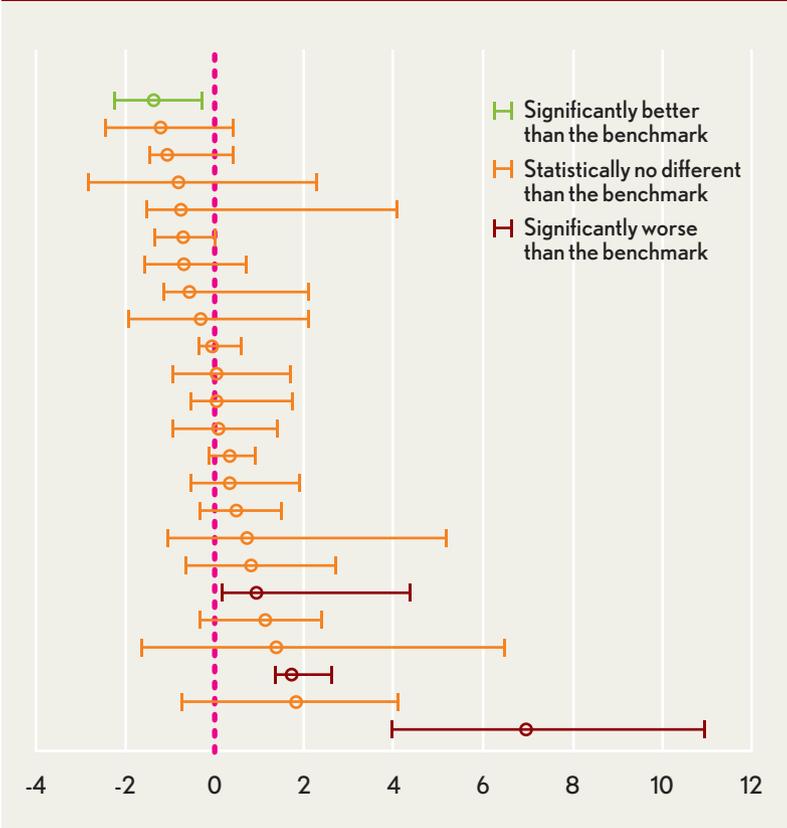
Through this comparison, dramatic variances were evident (see the exhibit on page 5). The best performers had a 0 percent mortality rate for heart failure patients, compared with 5.5 percent among the lowest performers. Additional findings for the best performers relative to the lowest performers were as follows:

- > Average LOS was 39 percent lower (3.1 days versus 5.1 days for the lowest performers).
- > The 30-day readmission rates were 42 percent lower (17.8 percent versus 30.5 percent).
- > Overall average adjusted direct costs were 25 percent lower (\$3,725 versus \$4,957).

To learn more about the cost variation, the team performed a more in-depth analysis of specific physician orders, comparing the top-performing physician’s performance with the average for all physicians. The analysis disclosed that the top-performing physician ordered one fewer respiratory treatment per case and one fewer lab test (i.e., a complete blood count) than did the average physician. In addition, patients cared for by the best-performing physician had a one-day shorter time spent in an intensive telemetry bed. When the costs of these three items were considered across all 4,996 patient cases for two years, the best-performing physician’s total cost of care for patients with heart failure was \$654,609 lower than that for an average-performing physician.

Franciscan Alliance has effectively used reports based on this detailed analysis to help its lower-performing physicians recognize the need to bring their practices in line with their better- and best-performing colleagues. This heightened

**HEART FAILURE AND SHOCK INPATIENT LENGTH-OF-STAY VARIATION BY PHYSICIAN, COMPARED WITH MEDICARE 50TH PERCENTILE, AUGUST 2014-JULY 2016**



Source: Franciscan Health Alliance. Used with permission.

awareness promises to raise the health system’s overall performance.

**Applying Learnings**

As these two case studies show, sophisticated data analytics that allow healthcare organizations to display and review data in different ways can play a profoundly important role in identifying the root causes of unwarranted variation in clinical care outcomes and costs. Just as important is the ability to benchmark performance against historical trends, performance targets, and peer groups. As healthcare leaders invest resources and time in analytics, they also should consider the following lessons learned.

**Prioritize for a laser focus.** Focusing on the high-volume, high-cost, low-quality clinical conditions can help speed clinical improvement efforts. For example, in an effort to target the conditions that would present the greatest opportunity for improving LOS, cost, and quality, Franciscan Alliance zeroed in on heart failure, pneumonia, and sepsis, among other conditions.

Twenty conditions accounted for nearly half (47.7 percent) of all Franciscan Alliance hospital costs in 2013. Topping the list nationally are sepsis; osteoarthritis; births; complications related to devices, implants, or grafts; and heart

attacks.<sup>a</sup> By choosing four of these 20 costly conditions to focus on each year, the hospital system could lower costs and improve quality for the majority of patients in just five years.

**Ensure the data are credible.** If clinicians are skeptical about the benchmark data or do not believe the data are comparable, they will not trust the conclusions. UTMB therefore recognized that it would be necessary to obtain benchmark data that would accurately reflect its obstetrical patient population. The hospital’s maternal-fetal medicine program specializes in high-risk pregnancies, and a high proportion of patients are on Medicaid. In addition, most of the babies cared for in UTMB’s neonatal intensive care unit (NICU) are born at UTMB (in-born), with very few having been born at another hospital and then transferred to UTMB’s NICU after delivery.

Using data from public and proprietary databases, UTMB was able to create for benchmarking purposes a custom group of hospitals with a high percentage of in-born infants and Medicaid cases and a similar proportion of high-risk patients. UTMB’s leaders understood that whether patients had received good prenatal care was a determining factor for effective benchmarking, because

a. Torio, C.M., and Moore, B.J., *National Inpatient Hospital Costs: The Most Expensive Conditions by Payer*, Agency for Healthcare Research and Quality, May 2016.

BEST-PERFORMER ANALYSIS FOR HEART FAILURE*						
	Discharges	Inpatient Average LOS	Mortality Rate†	1- to 30-Day Readmission Rate‡	Case Mix Index	Overall Adjusted Direct Cost
<b>Best Performers</b>	278	3.1	0.0%	17.8%	1.265	\$3,725
<b>Lowest Performers (“Outliers”)</b>	619	5.1	5.5%	30.5%	1.253	\$4,957
<b>Heart Failure Overall</b>	5,274	4.4	2.6%	20.9%	1.257	\$4,674

\* Data from August 2014 to July 2016, except for costs, which were tracked from August 2014 to June 2016.

†Mortality and cost: Excluded patients who left against medical advice.

‡Readmission: Excluded patients whose discharge status was expired, patients who left against medical advice, planned readmissions, and psychiatric and rehabilitation patients.

Source: Franciscan Health Alliance. Used with permission.

obstetrical patients who do not receive such care tend to have more demanding care requirements, causing the population overall to carry a higher complexity or comorbidity level. Because UTMB's maternal-fetal medicine program specializes in high-risk pregnancies, the data from hospitals with lower-risk populations are not likely to be comparable no matter the level of risk adjustment.

**Normalize the data.** Knowing what data to leave out also is critical to an analysis and ensuring physician buy-in. For instance, when creating a report to identify true opportunities for reducing LOS in key service lines, Franciscan Alliance's team filtered out types of "outlier" patients (e.g., newborns, psych, observation) who might have extended or shortened the average LOS. Excluding these outliers precluded any arguments that these exceptions were driving the mean or average.

**Integrate a variety of quality and cost data.** A critical capability in data analytics is the ability to obtain and integrate various types of data from different sources. The effectiveness of Franciscan Alliance's best-performer physician analysis depended on the integration of rich data resources with the organization's own data to identify comparative LOS, readmissions, and mortality performance.

**Sparking Clinician Interest**

Sophisticated data analytics capabilities underpin a healthcare organization's ability to deliver the high-value care healthcare patients and purchasers require. They do so through engaging physicians in clinical improvement work. Data can be used to tell a story that sparks physician interest. Clinicians tend to respond positively

when they are presented with readmissions data, for example, in a way that quickly provides a narrative that communicates a meaningful story, such as highlighting the avoidable factors that led to unnecessary readmissions. Clinicians appreciate having the data presented in this way because they rarely can take the time to dig through the data to find the story on their own. ■

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**Acknowledgments**

The authors greatly appreciate the assistance of experts at the profiled organizations, who helped to develop and review this article. At UTMB Health, special thanks to George Saade, MD, chief of obstetrics and maternal fetal medicine; Gulshan Sharma MD, MPH, vice president, and chief medical and clinical innovation officer; and Mark Kirschbaum, RN, PhD, then-chief quality, safety, and clinical information officer. At Franciscan Alliance, special thanks to David K. Kim, director of strategic and decision support, and Richard Need, MD, medical director of evidence-based medicine.