



**Texas Children's
Hospital**

Calculating the ROI of Diabetes Care Improvement

Texas Children's Hospital—an internationally renowned organization committed to creating a community of healthy children through excellence in patient care, education, and research—is on the forefront of establishing a culture where quality and cost are top of mind for physicians.

One of the health system's many successful quality- and cost-improvement initiatives addresses diabetes mellitus (DM) care. In 2009, Texas Children's clinical and operational leaders noted a significant and growing degree of variation in the management of diabetic ketoacidosis (DKA). Given the high cost of DM and DKA care, the great volume of patients, and the variation in treatment, these leaders selected DM for a focused improvement effort. As the project has progressed, not only has Texas Children's successfully improved DM outcomes, but it has also developed a framework for measuring the ROI of its efforts.

A DATA AND ORGANIZATIONAL FOUNDATION FOR IMPROVED DIABETES CARE

Texas Children's tackled its DM initiative with a combination of technology investments and new organizational models. The health system had previously implemented an enterprise data warehouse (EDW) and analytics platform from Health Catalyst®. Data-driven improvement efforts had already yielded significant [clinical](#) and [operational](#) improvements, resulting in savings of tens

of millions of dollars. Leaders determined to apply this analytics infrastructure to DM care.

In addition, the organization invested in a clinical care process team model for improving the quality and cost of care using data and evidence-based guidelines. Leaders created a care process improvement team tasked with improving inpatient DKA management, reducing variability, and lowering costs. Significantly, Texas Children's also created a diabetic care unit (DCU) staffed by a highly specialized, highly trained group of providers who could provide the highest-quality evidence-based care.

DEVELOPING A FRAMEWORK TO ASSESS RETURN ON INVESTMENT

In collaboration with the business school at Rice University, Texas Children's developed a framework to better understand the ROI of its quality improvement efforts, beginning with diabetes population health management. They designed the framework to assess the impact of the care process team's work, including the creation of the DCU.

Using data from its EDW, Texas Children's took a pragmatic approach to the framework's design, focusing on easily quantifiable drivers. The team determined that the principal drivers were decreased length of stay (LOS) and a shift in patient volume from the pediatric ICU to the newly formed DCU. The model focused on the four most

In the current climate of rising costs and declining reimbursement, quality alone isn't enough. Physicians need to become actively engaged in improving value—and that includes taking accountability for the financial implications of their clinical decisions.

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common paths through the organization taken by admitted DKA patients as well as the calculation of average hours spent, average cost, and patient volume by path.

Health system leaders recognized that this model would inherently understate the program's ROI. For example, the model took into account the full cost of the care process team, even though the team did not focus exclusively on the DKA project. Furthermore, leaders chose not to assign a dollar value to important but difficult-to-quantify outcomes such as quality of life, functional outcomes, and patient and family satisfaction.

MEASURABLE RESULTS IN DIABETES POPULATION HEALTH MANAGEMENT

The health system's improvement efforts led to substantially better quality of care for DM patients. In addition, more efficient and effective DM care resulted in a greater contribution to margin for managing the disease.

Using its model, Texas Children's calculated a conservative ROI of 53 percent. The greatest financial impact of the initiative came from two sources:

➤ **Decreased LOS.** Measures such as the integration of evidence-based order sets and decision support through the EMR improved LOS from 3 days to 2.1 days in just one year. As LOS significantly decreased, charges per patient also decreased. Waste was eliminated and all appropriate care was delivered in a much shorter time period.

➤ **Shifting patient volume to DCU.** DKA patient utilization shifted from the more expensive pediatric ICU to the DCU. Moving DKA patients to the DCU resulted in more targeted and efficient care—and opened up valuable bed space in the ICU. Based on this shift and reduced LOS, the health system projected a net revenue increase of \$232,000 annually.

These results represented a triple win: better outcomes for patients, lower cost of care delivery for payers, and greater return for the institution.

WHAT'S NEXT?

Texas Children's continues its efforts to improve the quality and cost of care processes throughout the enterprise. Leaders will apply the ROI framework to quantify cost savings as well as quality improvements. 📈

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