Collaborative Partnerships and a Three-System Approach to Driving Healthcare Transformation

Texas Children's Hospital®

HEALTHCARE ORGANIZATION

Children's Hospital

PRODUCTS

- Health Catalyst® Analytics Platform, including the Late-Binding™ Data Warehouse and broad suite of analytics applications

EXECUTIVE SUMMARY

Healthcare organizations are among the most complex forms of human organization ever attempted to be managed, making transformation a daunting task. Despite the challenges associated with change, Texas Children's Hospital identified that it needed to evolve into a data-driven outcomes improvement organization.

Texas Children's faced challenges in delivering on its mission to create a healthier future for children and women throughout the global community by leading in patient care, education, and research. Limitations of its electronic health record (EHR) system combined with variable levels of expertise in outcomes improvement impeded the health system's ability to transform.

Texas Children's embarked on a journey to transform care, building a three-systems approach—analytics, best practice, and adoption. This initiative was designed to develop a data-driven quality improvement organization that could achieve outcomes improvement expediently and at scale across the entire organization. Texas Children's leadership knew that the foundation for clinical systems integration would be meaningful, actionable data. That realization prompted the organization to implement the Health Catalyst® Analytics Platform including the Late-Binding™ Data Warehouse (EDW) and a broad suite of analytics applications.

After deploying the analytics platform supported by multidisciplinary quality improvement teams, Texas Children's was able to improve patient outcomes related to the following:

- 35 percent relative decrease in hospital-acquired conditions (HACs).
- 44 percent relative decrease in LOS for patients with Diabetic ketoacidosis (DKA).
- 30.9 percent relative reduction in recurrent DKA admissions per fiscal year.

To transform healthcare, there must be commitment from the leadership to improve quality and improve safety.

Trudy Liedech, RN, MBA
Assistant Vice President

OVERVIEW

Characterized as the most complex form of human organization ever attempted to be managed,[1] healthcare organizations are the subject of many written pieces, especially regarding the need for transformation in healthcare. Enter "healthcare transformation" into any Internet search engine and you're immediately rewarded with more than a million results.

Contributing to the need for transformation, it is widely acknowledged that the current rate of healthcare spending is unsustainable. In 2009, the Social Security Advisory Board characterized the rising cost of healthcare as the most significant threat to the long-term economic security of workers and retirees.[2] Despite significant strides since that time, health care costs, and quality, are still concerning.[3]

Texas Children's Hospital, a not-for-profit organization, features recognized Centers of Excellence in multiple pediatric subspecialties including the Cancer and Heart Centers, and operates the largest primary pediatric care network in the country. The hospital is nationally ranked among the nation's top children's hospitals by *U.S. News & World Report* and *Parents* magazine. Its mission is to create a healthier future for children and women throughout its global community by leading in patient care, education, and research. To continue its mission into the future, Texas Children's needed to transform care delivery.

BARRIERS TO HEALTHCARE TRANSFORMATION

By implementing an EHR in 2008, Texas Children's began a journey that would allow it to use data to inform decision making. Unfortunately, it quickly realized that the EHR alone did not encompass everything needed to improve patient outcomes. Like most other hospitals and health systems at the time, Texas Children's had envisioned the EHR as a nearly all-powerful tool capable of improving quality. However, it still experienced substantial variability, and it was incredibly difficult to extract data from the EHR, limiting its ability to evaluate performance or inform decision making.

Texas Children's faced other challenges in delivering on its mission to create a healthier future, as well. In addition to the limitations of the EHR, the hospital's variable levels of quality improvement expertise were impeding its ability to transform and improve care outcomes.

> Our ability to use data to improve patient care is incredibly powerful. We can now ask what worked better. If I look at this patient no matter where they received care in our system, we can see if we are doing the right things. Are we providing the right clinical standard, can I measure it, and am I using that data to create the next iteration of strategies for improvement?
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> Charles Macias, MD, MPH
> Chief Clinical Systems Integration Officer

In many healthcare organizations, information technology (IT) teams—including data architects and data analysts—and quality and clinical teams work in silos. IT provides the technologies, designs and delivers reports, without a clear understanding of the needs of the quality and clinical teams. This can sometimes turn into a finger pointing exercise. Quality and clinical teams claim IT is not delivering the data they need to succeed, while IT insists the others are not clearly articulating what they need. It takes clear-eyed analysis to see that the teams are failing to work together to prioritize their outcomes improvement initiatives and drive sustainable outcomes.

Texas Children's identified that it needed to change and become a data-driven quality improvement organization focused on improving care processes and care outcomes. Rather than relying on individual skill and experience, the organization wanted data to drive decision making and needed to be confident that it was providing patients care that was consistent with the most recent evidence and best practices. The team knew the only way it would be successful was to have a strong partnership between IT, clinical, and quality improvement teams. Texas Children's also needed to ensure that its leaders, both clinicians and administrative leadership, had the knowledge, skills, and ability to lead quality improvement.

USING A THREE-SYSTEM APPROACH TO DRIVE OUTCOMES IMPROVEMENT

Texas Children's embarked on a journey to transform care, building a three-systems approach incorporating analytics, best practice, and adoption. Performing as a data-driven quality improvement organization and advancing outcomes with speed and scale across the entire organization requires this approach.

Beginning this transformation at the top, Texas Children's is developing an organizational strategy consistent with the goals outlined in the IHI's Triple Aim. Referred to as clinical systems integration, the hospital's strategy focuses on implementing integrated approaches designed to improve population health, improve care experience and outcomes of care, and reduce costs per capita.

Clinical systems integration includes several key components, such as governance that brings services across the organization to build a coordinated, mutually supportive, integrated system of care. Inter-disciplinary teams across the entire organization engage to standardize care delivery, creating a patient-centered experience of care, regardless of where in Texas Children's that care is provided.

> Systems will always produce data. The ability to correlate, aggregate, and analyze that data to make decisions, which allow us to improve specific challenging outcomes that we haven't been able to improve before, is very powerful. That is what our future is.
>
> Myra Davis
> Chief Information Officer

Additionally, the hospital gathers physician input and establishes leadership in all levels of the organization.

To facilitate the ability of its teams to use data to drive their decision making, Texas Children's implemented the Health Catalyst® Analytics Platform.

Bringing in an analytics platform

At Texas Children's, implementing the EDW resulted in the standardization of terminology and measures across the organization and provided the ability to easily visualize performance. These critical steps allow for the collection and analysis of information organization-wide. The EDW aggregates data from a wide variety of sources, including clinical, financial, supply chain, patient satisfaction, and other operational source systems' data.

Texas Children's provides broad access to data, including to the CEO and other operational leaders, department heads, clinicians, and frontline leaders. When faced with a problem or question that requires information, clinicians and leaders don't have to request a report and wait days or weeks for data analysts to build it. The analytics platform provides clinicians and leaders the ability to visualize data in near-real time, and to explore the problem and population of interest. This direct access increases the speed and scale with which Texas Children's can achieve improvement. Obtaining data required to understand current performance no longer takes weeks or even months.

The analytics platform delivers performance data used to inform organizational and clinician decision making, evaluate the effectiveness of performance improvement initiatives, and increasingly, predict which patients are at greatest risk for an adverse outcome, enabling clinicians to mobilize resources around the patient to prevent this occurrence.

While the analytics platform is incredibly powerful and provided Texas Children's the ability to easily visualize its performance, setting the stage for data-driven outcomes improvement, the hospital knew that tools and technology alone don't lead to improvement. To be effective, clinicians, IT, and quality would have to partner together to identify best practices and design systems to adopt them by building the practices into everyday workflows.

> We try to be certain that we don't just run to a solution. We strive to avoid holding conversations just about technology, rather, initiate conversations about the problem, and when you understand the problem, determine if technology is a helpful solution.
>
> Myra Davis
> Chief Information Officer

Best practice and adoption systems

To achieve this goal, Texas Children's established the Evidence Based Outcomes Center (EBOC), which supports the use of science, and evidence- and consensus-based practices across the hospital. The EBOC develops evidenced-based clinical guidelines designed to help Texas Children's clinicians manage the complexity of care and minimize variations in clinical practice. A multidisciplinary team of experts at the EBOC develops the guidelines, which are then implemented into clinical practice.

The EBOC focuses on eliminating waste and improving the effectiveness of care. The clinical standards, guidelines, and order sets developed by the EBOC eliminate unwanted variation by standardizing care delivery, and improve outcomes by eliminating waste (e.g. over-ordering, errors in order entry, ordering items that do not improve outcomes of care, etc.). The EBOC partners closely with IT, maximizing the impact of the clinical guidelines through integration into the EHR.

As part of building best practices and an adoption system, Texas Children's needed to ingrain quality improvement as an inherent part of the overall organizational culture, not just within the quality department. The organization wants each employee to embrace the philosophy of quality improvement, and to understand how their role supports achieving the organizational goals. Each team member is empowered to ask questions, identify opportunities for improvement, and drive change.

To further support clinicians and leaders in driving outcomes improvement, Texas Children's:

- Developed comprehensive quality improvement training. Introductory quality improvement training is provided to all new hires, and quality improvement training is scaled across the organization to meet differing learner needs with offerings for those who are new to quality improvement, intermediate training for those who have some experience, and advanced training for those leading quality improvement activities. This helps deliver the right information to the right employee, and in a way that they can most easily integrate into their workflow.
- Uses data from the EDW to prioritize improvement activities, placing higher importance to address care processes when 1) the care is costly, 2) there is a large number of patients, or 3) there are significant variations in care.

> Our technologies are powerful tools that help us drive improvements to care. The data and analytic capabilities we now have are really endless.
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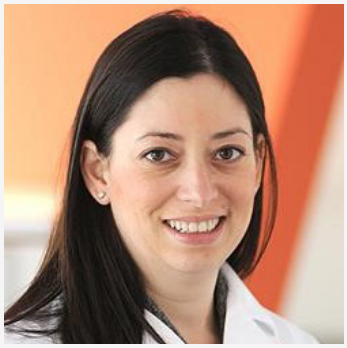
> Kathleen Carberry
> MPH, BSN, RN
> Director Outcomes and Impact Service



Medicine with data available at the hands of caregivers allows us to look at issues in an unbiased way. We are able to use the data to inform our decisions. When you know your data is true, reliable, and valid, you can feel very confident about using that data to transform and invigorate change.

Rona Sonabend, MD
Assistant Professor of Pediatrics
Pediatric Endocrinology & Metabolism
Baylor College of Medicine

- Creates a Care Process Team (CPT) for the care process in question. CPTs are permanent, interdisciplinary teams responsible for identifying areas for improvement that are aligned with the broader organizational goals, and the development of standardized evidence-based care guidelines. CPTs apply the science and principles of quality improvement in the real world, developing specific aims and interventions for rapid-cycle process improvement, and evaluating the effectiveness of the intervention using visualizations and near real-time performance data from the EDW. These teams are also responsible for driving the adoption of these guidelines into the workflow within that specific care process.

Texas Children's learned that the ideal CPT includes experts in evidence-based practice, IT (including data architects and data analysts), operational leaders, quality, and members from the inter-professional team (e.g. physicians, nurses, pharmacy, etc.). The size of the team and needed expertise varies depending upon the problem the team is working on, but each role is required for the team to be effective.

To be successful, team members also must learn and develop new competencies. Clinicians and quality representatives on the team are required to further develop their data literacy, learning how to interrogate data and ask the right question to get the answer they need. IT team members began asking questions about the workflow, process, and desired outcome, seeking to better understand the need prior to suggesting a technical solution, rather than simply building reports as requested. Only after these skills are in place can IT effectively partner with clinicians and quality, using data and analytics to drive outcomes improvement.

IMPROVEMENTS IN PATIENT OUTCOMES

Texas Children's IT-Quality-Clinical Partnership and its three-systems approach has transformed the organization—dramatically increasing the speed and scale with which it improves outcomes for patients. Selected results include:

- Decreases in hospital-acquired conditions (HACs):
  - 35 percent relative decrease in HACs.
  - 50 percent relative decrease in the rate of central line urinary tract infections (CAUTI).

> We had a large number of clinicians involved in delivering diabetes care across the enterprise—and that broad involvement understandably led to variability in care. We needed to restructure our culture to create a consistent experience for all patients. By establishing a specialized care unit and standardizing evidence-based protocols, we are effecting real improvement and a real culture change. Quality of care is now at the forefront for all clinicians. The sheer number of clinicians and staff who have engaged in the improvement process is amazing.
>
> Rona Sonabend, MD
> Assistant Professor of Pediatrics
> Pediatric Endocrinology & Metabolism
> Baylor College of Medicine

- Diabetes improvements:
  - 44 percent relative decrease in LOS for patients with Diabetic ketoacidosis (DKA).
  - 30.9 percent relative reduction in recurrent DKA admissions per fiscal year.
  - 34.4 percent relative improvement in the percentage of patients with diabetes who receive the influenza vaccine.
  - More than 90 percent of patients receive the annual preventative screening recommended by the American Diabetes Association for thyroid stimulating hormone, lipids, and retinal exams, and more than 80 percent receive recommended microalbumin testing.
- Asthma improvements:
  - Decreased inpatient length of stay by 11 hours.
  - Achieved and sustained a 49 percent decrease in unnecessary chest X-ray orders.

WHAT'S NEXT

Texas Children's is continuing its journey to transform care. It has developed and continues to nurture its IT-Quality-Clinical Partnership, while building an effective three-systems approach that improves patient outcomes. The hospital continues its work to optimize the EHR, increase decision supports at the point of care, and implement more predictive analytic models.

REFERENCES

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ABOUT HEALTH CATALYST®

Health Catalyst® is a next-generation data, analytics, and decision support company committed to being a catalyst for massive, sustained improvements in healthcare outcomes. We are the leaders in a new era of advanced predictive analytics for population health and value-based care. with a suite of machine learning-driven solutions, decades of outcomes-improvement expertise, and an unparalleled ability to integrate data from across the healthcare ecosystem. Our proven data warehousing and analytics platform helps improve quality, add efficiency and lower costs in support of more than 85 million patients and growing, ranging from the largest US health system to forward-thinking physician practices. Our technology and professional services can help you keep patients engaged and healthy in their homes and workplaces, and we can help you optimize care delivery to those patients when it becomes necessary. We are grateful to be recognized by Fortune, Gallup, Glassdoor, Modern Healthcare and a host of others as a Best Place to Work in technology and healthcare.

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