

Texas Children's Hospital

Understanding how clinicians engage on healthcare costs

Summary

Texas Children's Hospital Combines Clinical, Financial, and Administrative Data to Identify Costly, Highly Variable Care Processes and Implement Clinician-Led Improvements

Many health care institutions are grappling with how to leverage their clinical, operational, and financial data to improve quality and reduce costs. By creating an enterprise data warehouse, Texas Children's Hospital can identify processes across the organization that are costly, high-volume, and have wide practice variation. Integrated nurse- or physician-led care process teams use this data to develop and test improvement strategies designed to reduce costs and waste. The enterprise data warehouse also feeds near-time data into data visualization tools that enable the care process teams to monitor the initial and ongoing successes of the changes they implement. When relevant, these tools include financial information so that care process teams can understand the impact that the process change has on costs. Since launching this multi-step approach in 2012, Texas Children's Hospital has used it for nearly 50 disease processes, and, as a result, has achieved significant reductions in the cost of care.

Context of the Innovation

Texas Children's Hospital (TCH) is a not-for-profit health care organization located in Houston, Texas. Affiliated with Baylor College of Medicine, it includes two children's hospitals, a women's hospital, an urgent care group, a network of over 50 primary care pediatric practices, a health plan, and physician service organizations. TCH is the largest children's hospital in the US. Prompted by the Affordable Care Act and other national health information technology and data initiatives, health care

Description of
the Innovative
Activity

organizations across the country have focused on unlocking the potential of data to drive value. Though health care organizations have begun to routinely capture a large volume of clinical, operational, and financial data, many are struggling with integrating and analyzing these data in a way that provides meaningful information to direct quality improvement and cost reduction activities.

Faced with this challenge, TCH developed a structure to transform the use of its disparate data sources to guide decisions to deliver optimal, high value care. Its “clinical systems integration (CSI)” approach combines clinical, financial, and operational data with 1) evidence-based practice, 2) quality improvement education and implementation, and 3) data analytics. These combined elements create the information and processes needed to reduce fragmentation and practice variation, lower costs, and improve care across patient populations.

TCH uses a CSI approach to convert disparate data across the institution into actionable information that can be used to reduce costs and improve quality. TCH’s enterprise data warehouse (EDW), which amasses numerous data sources, including clinical, financial, and administrative data, serves as the foundation of the approach. TCH analyzes the data to identify processes across the organization that are costly, high-volume, and have wide practice variation. Armed with this

information, integrated nurse- or physician-led teams develop and test improvement and cost reduction strategies. This approach is reflective of TCH’s broader organizational emphasis on quality improvement and financial responsibility. Key aspects of the innovation are described below:

- **Organizational culture that emphasizes quality improvement and financial responsibility.** The CSI approach reflects TCH’s broader organizational perspective that health care providers must be attentive to the clinical, financial, and operational effects of their practice. It has developed numerous educational programs to ensure its entire workforce understands the importance of the organization’s efforts to improve quality and reduce costs – focusing on why it is necessary, the importance of evidence-based care and mechanisms to reduce unwanted practice variation, and the need for clinician involvement. TCH also teaches a “Finance 101” to clinical staff so that these individuals understand how they influence institutional costs. Further, the organization made a strategic decision to include financial representatives in the care process teams and metric discussions so that relevant cost-of-care issues were considered throughout the process.
- **Underlying EDW structure:** TCH developed a robust EDW that includes numerous data sources from across the entire organization, including electronic health record, financial,

staffing, administrative, human resource, and patient satisfaction data. TCH worked with a third-party vendor to develop the EDW, which cost several million dollars. (Exact figures are unavailable.) TCH organizes EDW data around subject area “marts,” which are categorized according to a specific disease or operational process. TCH uses the EDW to identify clusters of disease processes across the organization that are costly, high-volume, and have wide practice variation, as well as to pull information on specific patient populations or cohorts. This activity identifies the focus areas of the integrated teams (see next bullet). TCH has a data analytics group that is responsible for managing the EDW.

- **Integrated nurse- or physician-led teams that identify opportunities for improvement and implement them quickly.** TCH’s integrated care process teams are led by physicians or nurses, along with an administrative liaison, and include clinical staff, administrators, data managers, outcomes analysts and quality improvement personnel. The teams review current care processes and use the information culled from the EDW/subject area marts to develop and test improvement strategies. The teams use a rapid-cycle, iterative process, with projects typically lasting 90 to 120 days. The goal is to make small improvements quickly over time. Care process team members are selected based on their content expertise and key leaders are allocated 10 percent “protected” time to direct the work on the teams.

Other care process team members participate as part of their regular duties.

- **Evidence-based resources available to care process teams.**

TCH's Evidence Based Outcomes Center (EBOC) creates evidence-based guidelines and other clinical standards that are designed to minimize unwanted variation in practice and reduce waste (e.g. in diagnostic testing, therapeutic management, operational throughput, or error). Under the CSI approach, the EBOC assists the care process teams in establishing and implementing clinical standards across the organization that create a common language for how care should be delivered.

- **Use of data visualization tools that include clinical as well as financial information to monitor implementation and impact.**

Near-time data from the EDW/subject area marts feed into data visualization tools such as dashboards, scorecards, and run charts that the care process teams can “point and click” to quickly and easily access. These tools enable the care process teams to monitor the initial and ongoing status of the changes they implement. The metrics included in the data visualization tools are developed or selected collaboratively by a group of experts, often using a modified Delphi approach, and are tailored to the specific disease process and phase of implementation. When relevant, the data visualization tools include financial information so that care process teams can understand the impact that the process change has on cost.

Impact

Since launching the approach in 2012, TCH has applied the CSI approach to nearly 50 disease processes. Select examples for how the CSI approach has reduced cost of care at TCH are included below.

- **Cost of care reductions in asthma:** After applying the CSI approach to asthma, TCH was able to reduce unnecessary chest X-rays for children with an asthma exacerbation by 46 percent. It was also able to decrease unwarranted practice variation and associated waste, which reduced cost of care – from an average loss of \$662 per inpatient asthma visit to an average contribution margin of \$1,020 per visit.
- **Similar cost of care reductions for appendicitis:** Similarly, applying the CSI approach to appendicitis, TCH reduced cost of care in a mixed cohort by 36 percent, and by 5 percent in a clean cohort in just 12 weeks.

Lessons Learned

- **Start small, prove the concept, and build over time.** When TCH began its first foray into CSI, some providers and administrators were skeptical about the utility of the approach and role of the EDW/data analytics. TCH began by making small time and resource investments and has grown these efforts over time. TCH notes that requests for additional care process teams and access to EDW information have far outpaced the resources that TCH initially allocated to this effort. TCH also notes that sharing

data about improvements in practice variation along with other measures that demonstrate positive quality and financial impact with TCH administrative and clinical leadership was helpful in prompting initial and ongoing support.

- **Data use has associated legal issues.** Since the EDW cross-cuts multiple entities, TCH has had to navigate legal issues associated with sharing and using data for quality improvement. Early and frequent consultation with legal counsel is necessary to understand these issues and develop privacy agreements that give sufficient protection to organizations that are supplying data while providing enough flexibility and access to facilitate quality improvement.
- **Governance structure impacts effectiveness of efforts.** Even with an integrated approach, TCH encountered fragmentation of efforts and data across organizational silos, particularly around surgical, medical, and obstetrical processes. As a result, it implemented a new governance structure across these entities to align organizational goals and priorities.
- **Defining the patient population effectively in data terms is critical but sometimes challenging.** Accurately identifying the target patient population or cohort is a fundamental requirement for tracking cost and quality outcomes over time, but it is not always easy to identify data parameters or variables that truly represent the study

population. For example, it is easy for a clinician to describe pediatric asthma but creating a definition of the disease that a computer system can interpret is a completely different analytical exercise. Also, TCH learned that purely administrative data often does not adequately capture pure patient cohorts. As a result, TCH supplements administrative data with prescription/medication, procedural, and interventional data to identify patient populations. This process has been critical to the success of the CSI approach and its ability to reduce waste and cost of care.

- **Guidelines are useful for reducing practice variation but need to be contextualized.** When attempting to implement processes to reduce practice variation based on clinical practice guidelines, it is critical to consider contextual factors and adapt these guidelines based on an organization's unique attributes such as patient population, geographic region, etc.

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Dr. Macias is boarded both in pediatrics and pediatric emergency medicine. He is a graduate of Stanford University and subsequently completed his medical degree at Southwestern Medical School. He has completed both a pediatrics residency and pediatric emergency

medicine fellowship. Additionally, he completed a fellowship in Clinical Research at the University of Colorado Health Sciences Center and subsequently completed a Master in Public Health at the University of Texas School of Public Health in Houston. He is an Associate Professor of Pediatrics at Baylor College of Medicine and Chief Clinical Systems Integration Officer at Texas Children's Hospital. He is also the Director of the Evidence Based Outcomes Center at Texas Children's Hospital and Director of the Center for Clinical Effectiveness at Baylor College of Medicine, Department of Pediatrics.

His national interest in improving the care for children has led to his role as the executive director of the Emergency Medical Services for Children Innovation and Improvement Center, utilizing improvement science to support the EMSC program in 58 states and territories. Additionally, he co-chairs the Improving Pediatric Sepsis Outcomes quality improvement collaborative of the Children's Hospital Association. This comes as he closes the work of the Pediatric Septic Shock Collaborative of the American Academy of Pediatrics, where in phase 2 of this work the collaborative reduced mortality from septic shock by 8%. He is the current chairman of the American Academy of Pediatrics, Section on Emergency Medicine, the largest professional society for pediatric emergency medicine physicians.

He was named Health Data Management's Clinical Visionary of the Year in 2014.