

# Streamlining Radiology Operations and Care Delivery through Analytics



## Texas Children's Hospital®

### HEALTHCARE ORGANIZATION

Children's Hospital

### TOP RESULTS

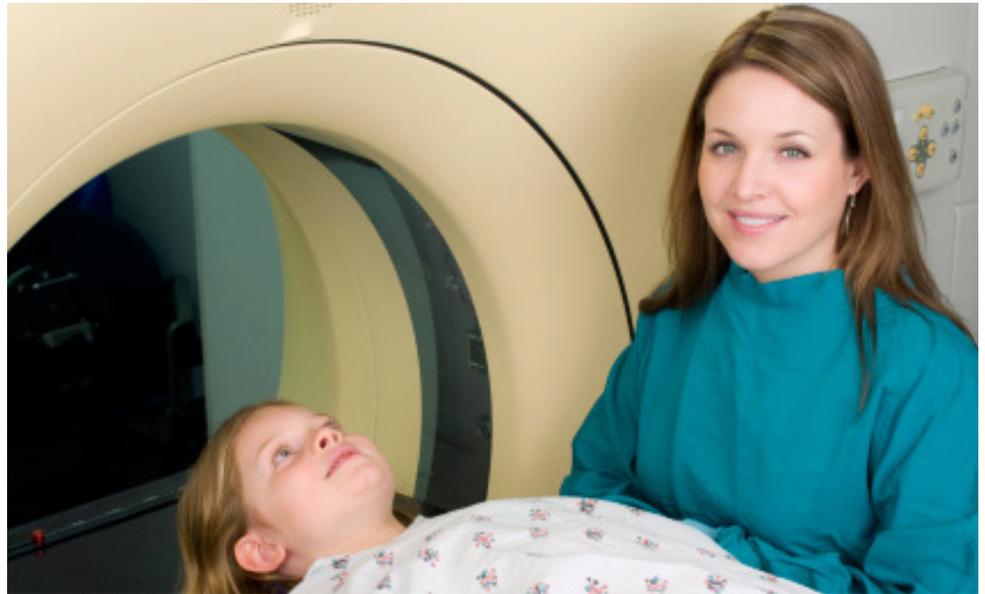
- Improved delivery of care and streamlined operations
- Established analytics platform and baselines for process metrics
- Automated reporting with an estimated \$400K savings

### PRODUCTS

- Late-Binding™ Data Warehouse
- Workflow/Operational Advanced Application-Radiology Module

### SERVICES

- Installation Services
- Clinical Improvement Services



### TEXAS CHILDREN'S HOSPITAL,

a not-for-profit organization consistently ranked among the top children's hospitals in the nation, has always looked for ways to improve the quality and efficiency of its patient care. Quality and efficiency have become even more important to the hospital amid the impending transformation of the reimbursement system from fee-for-service to value-based payment.

Texas Children's turned to a technology and a data-driven approach to enable its clinicians to deliver better, more efficient patient care. The hospital worked with Health Catalyst to implement the Health Catalyst Late-Binding™ Enterprise Data Warehouse (EDW) and advanced analytics applications. What hospital leaders found was the ability not only to analyze data on demand to improve clinical quality but also to increase operational efficiency in many areas.

Working with and refining the analytics application has taught me more about our EMR than I would have ever learned from the EMR itself. I've come to realize that the EMR is really just an empty shell you have to populate. And the data in the EMR needs to be managed aggressively.

Keith Wellmeyer  
Practice Administrator  
Texas Children's Department  
of Pediatric Radiology

“Once leaders in other departments saw what we were able to achieve with the radiology dashboard, they were envious. The potential value of a similar solution to their own departments was very clear to them. That’s why we plan to roll out the solution for every specialty, department and group within the hospital. Once we have this operational data coming in from all our departments and campuses, we can generate high-level executive reports that reflect the performance of the entire health system.”

Scott Martinez  
Senior Financial Analyst  
Corporate Financial Planning

One of the first areas to leverage the EDW and business intelligence applications to drive more efficient operations was Texas Children’s Department of Pediatric Radiology, a group of 30 board-certified pediatric radiologists. The group performs more than 220,000 procedures annually, making them one of the largest dedicated pediatric radiology centers in the country.

### THE PROBLEM OF INEFFICIENT INTERNAL REPORTING PROCESSES

Before implementing the EDW, Pediatric Radiology and other departments throughout the health system relied on an inefficient, time-consuming process to generate operational reports for internal reporting purposes. In fact, practice administrators and even senior leadership like assistant directors throughout Texas Children’s had to dedicate several hours a week to manual analysis for weekly or biweekly reporting — interfering significantly with time spent on other operational responsibilities and analysis of the data.

For Pediatric Radiology, creating such reports involved requesting data from the radiology Information Systems (IS) manager. Significant discussion between operations and IS personnel was required to determine which data was needed. The IS manager would have to manually extract the needed data from the electronic medical record (EMR) database. She would then send the data to the radiology practice administrator in an Excel spreadsheet containing as many as 300,000 rows of data.

At this point, the radiology practice administrator had to spend valuable time researching and making sense of the data, slicing and dicing it to build reports and analyze different variables. The difficulty of this task was compounded by the fact that a lot of important data was simply missing. For example, Pediatric Radiology lacked information on referrals, utilization metrics and diagnosis codes related to imaging procedures. In addition, the administrator had to work with the data further to create charts and graphs in a PowerPoint format for executive presentations.

Radiology was only one of many departments throughout the health system that would have to repeat this time-consuming process on a regular basis.

To streamline the process and enable better operational insights, Texas Children’s decided to implement Health Catalyst’s Operational Advanced Application—Radiology Module to run on its EDW platform. The health system had already deployed several advanced analytics applications on the EDW platform to drive clinical quality improvement. They were confident they could drive similar improvements on an operational front.

### RESULTS: STREAMLINED OPERATIONS AND IMPROVED CARE DELIVERY

The advanced analytics application provides a variety of data visualizations that enable Pediatric Radiology leadership and clinicians to easily understand and drill down into performance information. The visualizations draw from combined clinical, financial and patient satisfaction data. The group’s results from using this application to analyze operations and patient satisfaction have been impressive.

“The real ‘Aha!’ moment came when we were able to use the Health Catalyst solution to start pulling information by location, by modality, by specialty and by physician — really slicing and dicing our data to learn where our orders were coming from. We didn’t have a good system in place to look at that before, and yet it is essential knowledge for really understanding and managing our practice.

Keith Wellmeyer

## Established analytics platform and baselines for process metrics

Pediatric Radiology now has baseline data they can share quickly with senior management in a graphical, easy-to-understand format. The data includes process metrics such as:

- Average procedure duration
- Results turnaround time to providers
- Percentage of orders with reading residents
- Anesthesia utilization
- Resident or fellow cases
- Patient flow cycle time (including check-in to exam, check-in to results, end of exam to results, exam begin to exam end, and percent of appointments cancelled)

Having this data and this established baseline enables the department to target process improvement efforts that help drive improved patient and provider satisfaction.

## Automated reporting with an estimated \$400,000 savings

The ability to generate reports easily and immediately has saved the organization an estimated \$400,000 and has freed up operations personnel to focus on important strategic matters. The new process eliminates frustrations between IS and operations personnel because IS no longer has to perform regular manual reporting. The EDW solution enables the practice administrator to self-serve — accessing near-real-time data to make highly informed operational decisions.

Texas Children’s has embraced the [Healthcare Analytics Adoption Model](#) across their organization. With this streamlined internal reporting process, Texas Children’s is focused on level 3. The goal at level 3 is to create an environment in which internal reports needed for the basic management and operation of the organization — such as key performance indicators, management reports and interactive dashboards — are consistently and efficiently produced every month in an almost labor-free process. This automated, efficient process eliminates the “fire drill mentality” that consumes so many resources.

## Improved delivery of care and streamlined operations

The EDW platform has delivered insights to Pediatric Radiology that is helping the group improve care delivery, prevent service leakage and increase provider and patient satisfaction.

Examples of results and opportunities for improved delivery of care and patient satisfaction include:

- Pediatric Radiology can now track process metrics such as the time it takes to get results to a provider after an order is completed. The analytics application alerted the team to a decline in their performance on this metric. This information enabled them to address the delay issues, and they are now tracking back up at 85 percent for provider results turnaround time.

The ability for providers to obtain this clinical information quickly helps facilitate timely care delivery.

- ▶ Pediatric Radiology can now track the time between patient check-in and exam start time. Texas Children's has established a baseline for this metric that will help them understand their patient satisfaction as it relates to wait time.

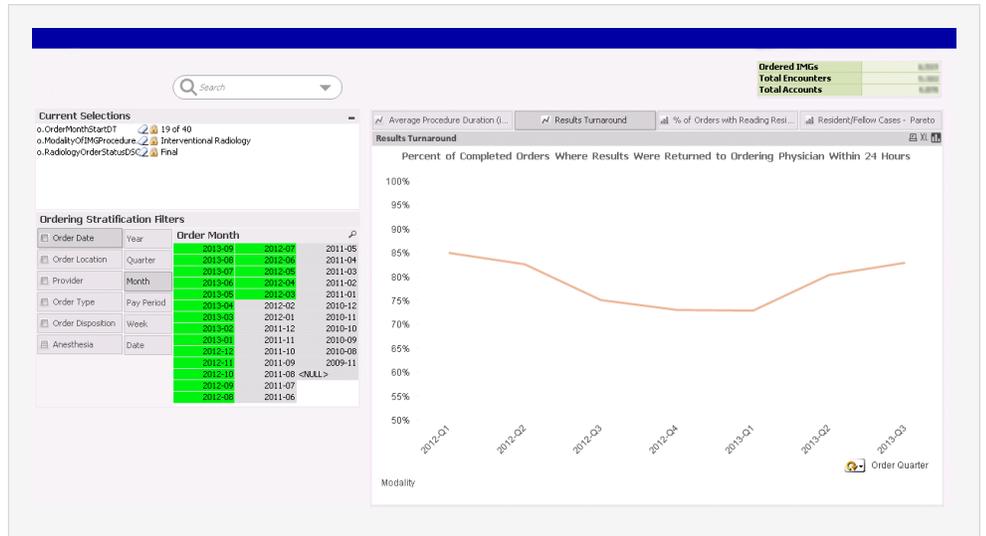


Figure 1: Sample Provider Results Turnaround Time

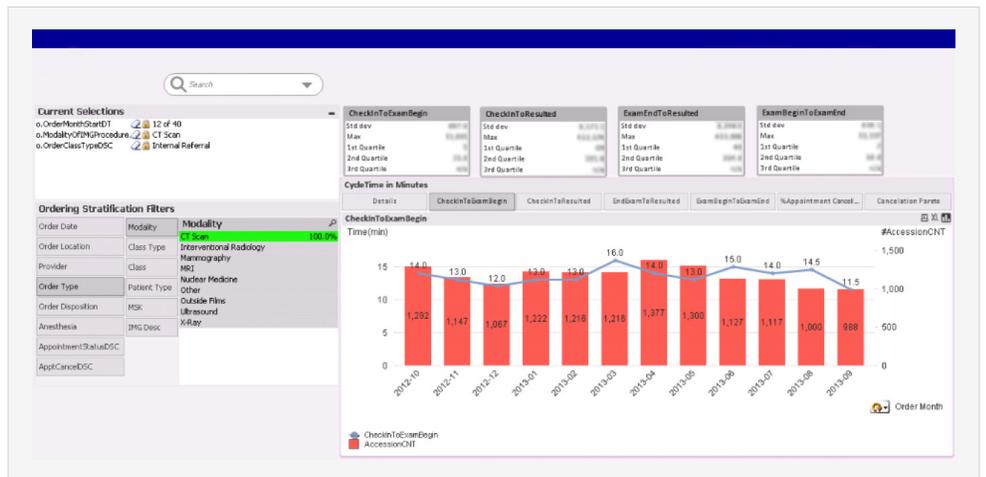


Figure 2: Sample Check-In to Exam Initiation

The EDW data has also helped Pediatric Radiology drive cost improvement. As described previously, moving from a manual process to automated, near-real-time reporting has driven significant efficiencies and dollar savings. The practice has also been able to reduce and avoid waste. For example, they are tracking anesthesia utilization to ensure appropriate, cost-effective use. They are also tracking their utilization of each piece of equipment — a process that has shown them where they have additional capacity so they can move volume around the system to maximize utilization and reduce scheduling lags.

EDW analysis has also enabled the group to increase revenue by minimizing procedure referral leakage. The health system recently acquired two obstetrics physician groups that weren't referring to Texas Children's Department of Pediatric Radiology. The advanced analytics application allowed the department to analyze both groups' orders — what they were ordering from Texas Children's and what they weren't — by modality and clinical indication. From this, they were able to extract the imaging procedures they didn't provide and easily determine which referrals they should have been receiving. After the department presented this data to the two groups, new referrals began flowing in immediately. Texas Children's estimates they have gained \$1 million in billable charges as a result of this effort and they have improved the delivery of patient care with an integrated patient healthcare record.

Finally, the availability of data in the EDW has streamlined internal processes like budgeting. In the past, the yearly budgeting process required spending several days getting operations and finance personnel on the same page. It might take days of discussion just to agree on the definition of a radiology unit of measure for volume. Now all teams use the same vernacular and measurements, making the process more efficient and focused on strategic planning rather than definitions.

### WHAT'S NEXT? SYSTEM-WIDE OPERATIONAL IMPROVEMENT

Texas Children's plans to integrate all of its source systems into the EDW to create a single source of truth for the entire organization. Importantly, its success improving operations in the radiology department is prompting the health system to roll out the operational analytics model incrementally throughout the organization. They plan to deploy similar dashboards and applications to every specialty, department and group within the hospital. 🚀

#### SAMPLE VISUALIZATIONS

1. Summarized analysis of billed procedures, gross charges and variable direct costs.
2. Filters that enable the information to be quickly sorted by modality, patient diagnosis, billing location and more.
3. Easy to understand graphical representation of the information.
4. Ability to drill into information such as specific radiology procedure volumes.

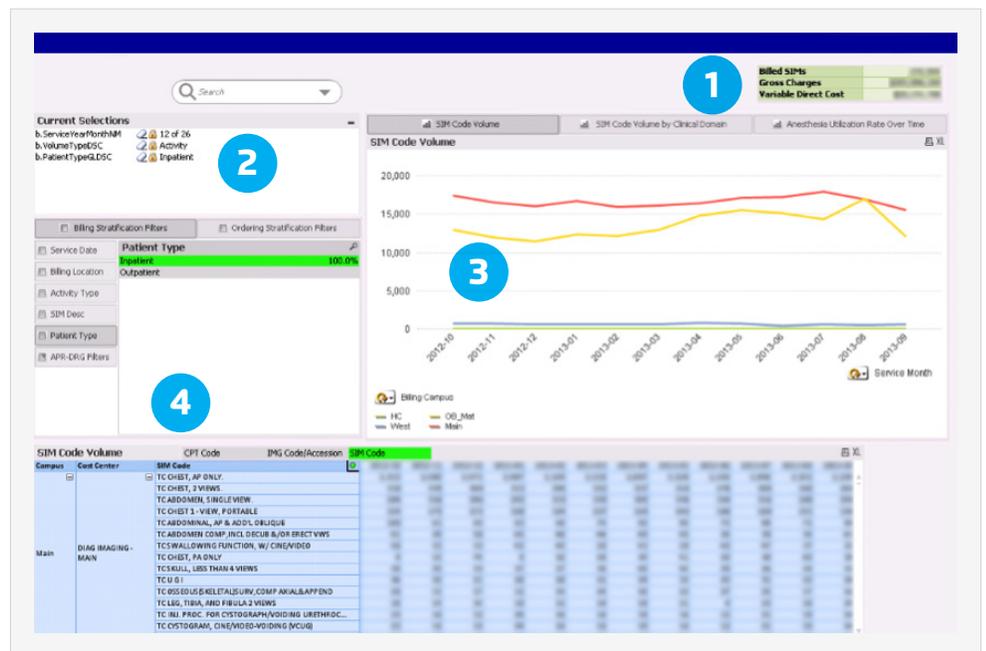


Figure 3: Sample Radiology Module Visualizations

## SAMPLE VISUALIZATIONS

1. Tabs for viewing additional detail, including orders Pareto, anesthesia utilization rate and order detail.
2. The ability to quickly sort and view information using filters (e.g. date, location, order type, providers and anesthesia).
3. Trended referral rates.

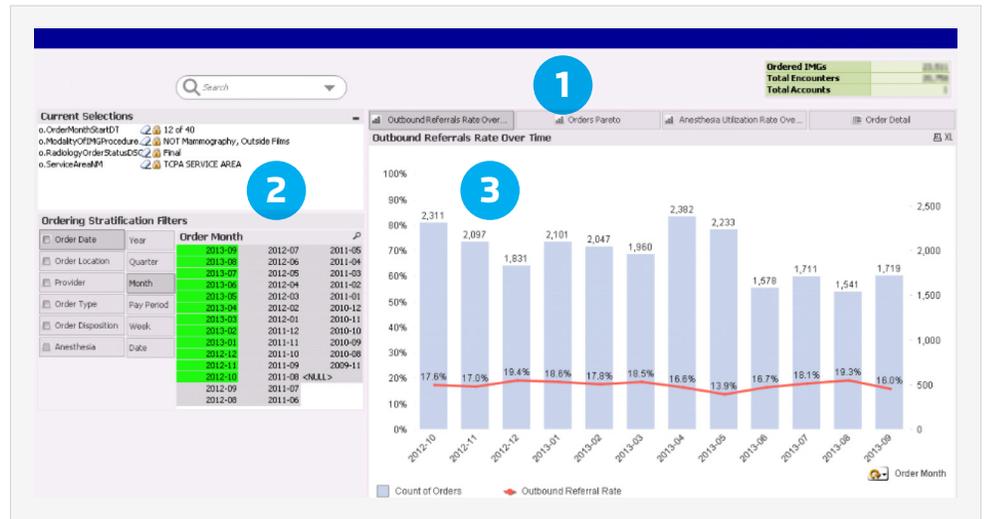


Figure 4: Sample Radiology Module Visualizations

## ABOUT HEALTH CATALYST

Health Catalyst is a mission-driven data warehousing, analytics, and outcomes improvement company that helps healthcare organizations of all sizes perform the clinical, financial, and operational reporting and analysis needed for [population health](#) and [accountable care](#). Our proven enterprise data warehouse (EDW) and analytics platform helps improve quality, add efficiency and lower costs in support of more than 50 million patients for organizations ranging from the largest US health system to forward-thinking physician practices.

For more information, visit [www.healthcatalyst.com](http://www.healthcatalyst.com), and follow us on [Twitter](#), [LinkedIn](#), and [Facebook](#).