

# Analytics Fuel Enhanced Recovery After Cardiac Surgery Improvements



**\$4.5M lower direct variable costs** for patients undergoing cardiac surgery.



**0.8 percent risk-adjusted mortality rate**—the lowest mortality rate among all hospitals reporting performance to the Centers for Medicare & Medicaid Services.

## PRODUCTS

- ▶ Health Catalyst® data platform
- ▶ Healthcare.AI™

## EXECUTIVE SUMMARY

WakeMed Health & Hospitals (WakeMed) was unable to obtain the real-time data needed for continuous improvement of its cardiovascular enhanced recovery after surgery program. Understanding performance and identifying opportunities for improvement was a manual and time-consuming process which impacted improvement efforts. By leveraging the Health Catalyst® data platform for its high-value data and analytics, the organization now has access to the data that supports continuous improvement efforts.

## COMPLICATIONS AFTER SURGERY: COSTLY AND LIFE-ALTERING

Complications after cardiovascular (CV) surgery are costly and can be life-altering for patients. Over ten years, total costs for complications with the coronary artery bypass graft, the most performed cardiac surgery, were \$78.6M, illuminating the importance of continuous quality improvement to improve patient outcomes and decrease costs.<sup>1</sup> WakeMed believed that access to high-value data and analytics could enable the organization to make significant strides toward continuous improvement efforts, particularly in reducing costly and life altering complications after CV surgery.

## PIONEERING ENHANCED RECOVERY AFTER CARDIAC SURGERY

WakeMed pioneered enhanced recovery after surgery (ERAS) interventions for patients undergoing CV surgery and was the first to implement a CV ERAS program. The CV ERAS program meaningfully improved patient outcomes and decreased costs for the organization. WakeMed quickly became a top performer for key performance indicators, such as mortality rate, incidence of stroke, and length of stay (LOS).

As part of ongoing improvement efforts, WakeMed wanted access to real-time data. Physicians and clinical leaders spent significant hours each year manually auditing medical records to obtain the detailed data required to understand performance and identify opportunities for improvement. These data abstraction efforts took time away from valuable improvement work. WakeMed needed a high-quality data and analytics solution that would provide timely, actionable, granular data to support its ongoing efforts to accelerate performance improvement.

## ACCESS TO DATA DRIVES IMPROVEMENT

The solution for WakeMed was the Health Catalyst® data platform and a robust suite of analytics applications, including a CV ERAS analytics application and Healthcare.AI™. WakeMed clinical leaders use high-value data and analytics in the analytics application to monitor and evaluate performance, compare patient cohorts and providers, and discover new areas for potential improvement. Healthcare.AI enables leaders to draw more accurate and consistent conclusions, and to do so more quickly.

WakeMed transparently and courageously shares performance data throughout the organization. All team members involved in the care of patients undergoing CV surgery can access the application and visualize performance. With open access to the data, the organization fosters a spirit of transparency and community, where questions are valued, and all are encouraged to contribute to improvement efforts. For example, program leaders engage with physicians and frontline team members to explore and question the data, identifying opportunities for improvement and ensuring widespread adoption of the CV ERAS protocols to further decrease unwarranted clinical variation.

With timely access to specific, actionable data, the CV ERAS program teams have uncovered new opportunities.

- **Identifying unwarranted variation.** While WakeMed had substantially reduced the number of morphine milligram equivalents (MMEs) prescribed to patients as part of implementing multimodal pain management pathways to support ERAS, teams identified potentially unwarranted variation in the MMEs administered by anesthesia. The data were shared with the anesthesia team, who immediately identified opportunities for improvement and implemented interventions to standardize care, decreasing the amount of MME used during operations while still providing adequate pain relief and improving recovery after surgery.
- **Ensuring patient ambulation.** WakeMed identified through the data that patients weren't always ambulating on postoperative day one. The organization intervened to ensure all patients ambulate on postoperative day one.



## ABOUT WAKEMED HEALTH & HOSPITALS

WakeMed Health & Hospitals is the leading provider of health services in Wake County, North Carolina. WakeMed is committed to improving the health and well-being of its community with outstanding and compassionate care to all.

“The Health Catalyst data platform gives us access to the tailored data and analytics we need to focus on outcomes improvement.”

Judson Williams, MD, MHS, Cardiovascular Surgeon, WakeMed Health & Hospitals

“Health Catalyst automated manual data abstraction efforts and gave us access to high-quality data and analytics insights we’ve never had before, improving our time to value and positively impacting patient lives.”

Gina McConnell, BSN, RN, CCRN, ERAS Coordinator, WakeMed Health & Hospitals

- **Highlighting differences in social determinants of health.** The organization discovered unique needs for patients identifying as female who were readmitted within 30 days; these needs differed from patients who identified as male, highlighting a difference in social determinants of health. Exploration of the data and conversations with patients identified that many female patients had more familial and social demands and expectations than their male counterparts. These expectations sometimes resulted in female patients not receiving adequate time for rest and recovery after discharge, and they would be readmitted with separated surgical incisions or other issues related to overexertion. The data illuminating these challenges provided the care managers and registered nurse navigators the opportunity to engage with patients and their families, ensuring patients received adequate support and rest post-discharge.

“By leveraging high-value data and analytics, we have been able to drive clinical and operational improvements across our organization, optimizing outcomes, streamlining workflows, and maximizing efficiency to deliver exceptional care.”

Neal Chawla, MD, Chief Medical Information Officer, WakeMed Health & Hospitals

## RESULTS

The Health Catalyst data platform provided the CV program with the data necessary to support continuous improvement efforts. For patients undergoing cardiac surgery, the organization has achieved:

- **\$4.5M** lower direct variable costs.
- **0.8 percent risk-adjusted mortality rate**—the lowest mortality rate among all hospitals reporting performance to the Centers for Medicare & Medicaid Services.
- **38 readmissions avoided**, the result of a 38 percent relative reduction in 30-day readmission rate.
- **34 percent relative reduction** in anesthesia-administered MME.
- **Zero sternal surgical site infections** for more than 14 months.
- **Greater than 80 percent** of all patients undergoing CV surgery ambulated on postoperative day one.



## WHAT'S NEXT

WakeMed will continue to advance the use of analytics across the organization and is integrating more health equity data into its applications, enabling it to identify and intervene where outcomes differ based on personal characteristics. 📈

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## REFERENCES

1. Mehaffey, et al. (2018). Cost of individual complications following coronary artery bypass grafting. *The Journal of Thoracic and Cardiovascular Surgery*. Vol. 155, Issue 3. Retrieved from [https://www.jtcvs.org/article/S0022-5223\(17\)32388-7/fulltext](https://www.jtcvs.org/article/S0022-5223(17)32388-7/fulltext)

## ABOUT HEALTH CATALYST

Health Catalyst is a leading provider of data and analytics technology and services to healthcare organizations, committed to `being the catalyst for massive, measurable, data-informed healthcare improvement. Our customers leverage our cloud-based data platform powered by data from more than 100 million patient records, and encompassing trillions of facts—as well as our analytics software and professional services expertise to make data-informed decisions and realize measurable clinical, financial, and operational improvements. We envision a future in which all healthcare decisions are data informed.

Learn more at [www.healthcatalyst.com](http://www.healthcatalyst.com), and follow us on **Twitter**, **LinkedIn**, and **Facebook**.