



Turning Data from Five Different EHR Vendors into Actionable Insights

When healthcare information systems don't talk to each other, countless inefficiencies and patient safety issues can pile up. To prevent these unwelcome effects and succeed in this value-based environment, Community Health Network (CHNw) embarked on a journey to integrate its healthcare information technologies.

These technologies include four electronic health records (EHRs) within seven acute hospitals, one ambulatory EHR supporting both clinical workflow and billing, and one free-standing ambulatory billing system—from five different EHR vendors—along with additional finance, HR, supply chain systems, patient safety, paid claims and patient experience data sources.

THE CHALLENGE: INTEGRATING HEALTH DATA ACROSS THE ENTERPRISE

Research shows that the use of more than one EHR from different vendors within a health organization, without the ability to integrate data across all EHRs and other data source systems, threatens patient safety and efficiency.¹ As an organization determined to deliver an exceptional experience to every patient, this was not a risk CHNw was willing to take. To prevent these errors, the health system had to solve several specific issues associated with having multiple, unintegrated data sources:

- **Lack of broad view into enterprise-wide data.** CHNw had no way to view and analyze clinical and operational performance data across the organization,

which complicated internal and external reporting. It was challenging, time consuming, and expensive to develop meaningful internal and external reports, like quality and patient safety regulatory and accreditation reporting. It also hampered efforts to identify and prioritize opportunities to reduce costs, while improving care and the patient experience.

- **Lack of data standardization and governance.** With so many different data sources—and data terms and definitions—CHNw was particularly challenged in performing meaningful enterprise analytics, such as evaluating clinical service lines across the health system's different regions.
- **Matching patients to care events.** For healthcare systems like CHNw that are transitioning to value-based reimbursement and population health management, it is imperative to be able to match patients accurately to their respective care events across multiple sites of care. Given CHNw's data situation, this was a complicated process.²

AN ENTERPRISE DATA WAREHOUSE MERGES SEGMENTED DATA

CHNw took a multifaceted approach to integrating health data across the enterprise, an essential capability to deliver outstanding, value-based care.

Enterprise data warehouse. CHNw selected a Late-Binding™ Data Warehouse (EDW) from Health Catalyst®

Even in the most data-rich environment, the ability to perform meaningful analytics and reporting is very limited without strong data governance and standardization. More importantly, patient safety is at risk.

Joe Pollman, Executive Director, Business Knowledge Management

to aggregate and house the health system's multiple sources of clinical, financial, and operational data. This enables the health system to easily mine data for improvement opportunities, while vastly speeding up major data initiatives. Historically, these projects required building a direct interface to each data source—a redundant process no longer needed with an EDW that needs just one interface to pull data in and push data out.

Data governance and standardization. Technology alone doesn't spur a cultural transformation. Executive sponsorship was also critical for CHNw to make changes in how data was collected, defined, and consumed. CHNw established a data governance committee with broad executive alignment that focuses on data standards, new enterprise reporting needs, education, and communication efforts.

Matching patients to care. To track patient encounters across multiple care locations and information systems, CHNw implemented a patient-to-patient matching solution. By integrating health data with financial and cost data, the health system can now easily correlate patient quality and cost—that is, understand exactly how value is being delivered. This insight is the difference between surviving and thriving in the new value based purchasing environment.

RESULTS

After implementing an EDW that integrates all key data sources, CHNw now has a comprehensive perspective across the enterprise. The health system can nimbly conduct reporting and engage in quality improvement initiatives, such as pinpointing care variation and measuring adoption of evidence-based guidelines.

- Data from multiple EHR vendors, including four inpatient EHRs and two ambulatory EHRs, plus five transactional systems—HR, patient experience, patient safety, finance, and supply chain—were integrated within 12 months.

- More than 55,000 data elements and over 18 billion rows of data were incorporated.
- Patient-to-patient matching was implemented for over 1.1 million patients across the four inpatient EHRs and paid claims for risk contracts. This is vital for managing patient populations.
- Operational efficiency was improved by 70 percent, with data architects spending an estimated 15 percent of time supporting interfaces compared to an estimated 40-50 percent before the integration. In one example, CHNw linked its ERP/costing system to the EDW's EHR source marts with just a single validated and governed interface; previously, this would have required building separate interfaces for all six EHRs with little corresponding validation and governance.

WHAT'S NEXT?

CHNw continues to strengthen and grow its data governance structure and strategy and eliminate redundant sources of reporting and analytics to optimize its EDW investment. The health system plans to expand integration by incorporating data from specialized systems including multiple claims sources, a Health Information Exchange (HIE), additional CAHP vendors and HR into the EDW. Now, well on the path to advanced data literacy and analytics-driven improvements, CHNw will continue to deploy new tools and applications that make a meaningful impact on every patient.

REFERENCES

1. Payne, T., Fellner, J., Dugowson, C., Liebovitz, D., & Fletcher, G. (2012). Use of more than one electronic medical record system within a single health care organization. *Applied Clinical Informatics*, 3(4): 462–474. doi: [10.4338/ACI-2012-10-RA-0040](https://doi.org/10.4338/ACI-2012-10-RA-0040)
2. American Health Information Management Association. (2009). *Managing the integrity of patient identity in health information exchange*. Retrieved from: <http://bit.ly/1LTwXTN>

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