Powering Data Interoperability in Pediatric Health Systems

Featuring case studies from 4 pediatric hospitals

LYNIATE

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Introduction

Children's hospitals play a special role in our communities and have needs that are different than those of adult hospitals. Every employee of every children's hospital — from the physicians and nurses to the administrative and IT staff — is there to improve the lives of the patients and families.

At Lyniate, we provide a vital piece of IT infrastructure, the interoperability platform, that gets data where it needs to be so clinicians and patient families can make informed medical decisions. More than 25 children's hospitals use one of our two integration engines — **Corepoint®** and **Rhapsody®** — to connect disparate systems internally and externally, getting the right data to the right person at the right time.

Here, we provide a close-up look at how four pediatric hospitals use Corepoint and Rhapsody to help provide the best possible care to patients.

Photo by Alexander Dummer on Unsplash

Case Study 1 **Cook Children's**

Using Corepoint to Gain Visibility into Key Hospital Operations

You can't manage what you can't see. In a hospital setting, visibility into key operations and processes is vital to its core mission, namely providing the highest quality patient care delivered with maximum efficiency.

And so it is at Cook Children's Healthcare System in Fort Worth, Texas, where efforts to connect data to care have taken the form of an innovative dashboard solution that seamlessly integrates data from various sources and functions. Hospital workers across all departments leverage real-time information to deliver patient services precisely when and where they are needed.

"In an environment where you are taking care of patients, you want visibility as a whole, not just for one particular patient," said Mark Pittman, Cook Children's enterprise data integration manager. "We were looking for a way that the executives and clinicians on the floor, along with other hospital staff, could actually look at a status board and get pertinent information that told them exactly what was going on, and when."

Out with Manual, In with Automated

"We had no big-picture visibility into key hospital operations," Pittman recalled. Cook Children's sought a solution that would fundamentally transform the way the not-for-profit healthcare organization could meet pressing interoperability and operational challenges, and ultimately improve the quality of patient care.

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>
> **MARK PITTMAN**
> Cook Children's enterprise data integration manager

As a Corepoint by Lyniate customer since 2009, Pittman knew all the organization's clinical data was flowing through Corepoint Integration Engine, and therefore interoperable and accessible to his team. With that knowledge in mind, the Cook Children's team developed its "Patient Location and Status Board" initiative. In it, the team took its various core applications, which are all integrated through Corepoint Integration Engine, to create a comprehensive feed for its McKesson Patient Visibility (MPV) system, yielding invaluable insights into various hospital operations, all in real time.

Designed with ease of use for any hospital worker, the dashboard proved to be "an instant hit," according to Pittman. "Interacting with it is basically touching the screen and then doing what you need to do depending upon your role," he explained.

Case Study 1 **Cook Children's**

Prior to bringing the dashboard project online, hospital staff used various manual procedures and hard-copy reports to determine patient room availability, room status, patients in need of transport around the hospital, patient pharmacy requirements, equipment availability and a plethora of other vital information needs.

Today, hospital executives begin each morning in a conference room to receive updates on the previous evening's activities and a look at the day ahead. Front and center in the conference room are several screens featuring the dashboard. Simple commands bring up images of floors, rooms, treatment areas, nurses' stations – literally any area of operations.

> The dashboard gives our executives a transparent, real-time, 360-degree view of the whole system, and a holistic perspective that greatly improves and speeds up overall decision-making.
>
> **MARK PITTMAN**
> Cook Children's enterprise data integration manager

The main order of business at this daily meeting is a comprehensive safety check. Any area in need of remedial work due to incidents occurring overnight are displayed and assigned a status showing what needs to be done to resolve potential safety issues. Various colored icons and symbols correspond to the status of patient rooms — whether they are vacant or occupied, or in need of cleaning or about to receive a new patient. Coming soon, the dashboard will note any special medical equipment the incoming patient might require. The location of a wheelchair, for example, can be pinpointed and then tagged for delivery to where it is needed, when it is needed.

A Holistic View of Hospital Operations

"The dashboard gives our executives a transparent, real-time, 360-degree view of the whole system, and a holistic perspective that greatly improves and speeds up overall decision-making," Pittman said. "It all comes together in the dashboard, and in a highly visual way that is so easy for anyone to understand and comprehend."

Beyond the boardroom and the main dashboard, a system of view-only screens are distributed throughout the hospital floors, accessible via PIN by doctors, nurses, environmental staff and other workers. What workers see on the screen depends upon their role.

For example, a worker looking to see which rooms need to be cleaned has no access to individual patients' prescriptions. The system gives the cleaning staff an at-a-glance view of which rooms are a cleaning priority, based on room assignments made by bed management or the house supervisor. A patient in the post-surgical recovery room

can be assured of a seamless transition without any delays to a clean room with all the necessary medical equipment in place.

As Pittman put it, "There are no more internal phone conversations like, 'I got this patient, where do I take him now? What floor is available?' Instead, a look at the status dashboard shows precisely which room on which floor is available and that's that." This functionality, according to Pittman, is also beneficial to properly load-balancing the floors.

A Boon to End Users, and to Patients

Gina Hernandez, supervisor/staffing coordinator at Cook Children's, noted that the dashboard is easy to learn, with staff becoming comfortable with the system within a few months of use.

"The patient care alerts, such as new, regular and stat orders, pharmacy orders, critical lab results and radiology results can help the nurse to see instant updates and have a more efficient workflow rather than stopping to check for new orders," she pointed out. "This can benefit the patient by receiving interventions of care faster, leading to better patient outcomes. Critical lab results can be communicated to clinicians in a timelier manner, and new orders can be received faster."

Hernandez reported that the dashboard results in patient room assignments being made more quickly, and that the number of phone calls back and forth has "dramatically decreased."

Plans are underway to do away with the traditional practice of having patient transport staff assigned to each floor, replacing that with a more efficient central transport team that leverages the dashboard to know "exactly when a patient will be ready for transport to another department, to their room or to another test area."

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>
> **GINA HERNANDEZ**
> Cook Children's supervisor/staffing coordinator

Fewer Errors

Some patients arrive at the hospital with their own supplies of drugs, which are turned over to hospital staff while the patient is hospitalized. Notifications entered into the dashboard alert the nurses to return the drugs to the patient when he or she is discharged. The automated process can also send alerts and pharmacy orders to the patient's pharmacy and to the pharmacist's mobile phone, pager, email or whatever way the pharmacist requests.

Case Study 1 **Cook Children's**

Other at-a-glance notifications and alerts available to the staff include special care instructions for individual patients; special safety information if, for instance, a potentially medically complex patient is admitted; information on patients that may need a full-time attendant such as those on suicide watch; and identification of patients in need of a translator. Every task is checked off as completed, which sharply reduces duplications of e orts and errors.

444 licensed beds

More than **60** pediatric medical offices and specialty clinics throughout Texas

38,037 Medical/surgical inpatient stays

126,910 Cook Children's Neighborhood office visits

For example, when a piece of special medical equipment is located and delivered, its new location is noted by the system and the primary task is marked as completed.

Business Value on Top of Clinical Value

The dashboard also helps the hospital achieve its own service-level agreements. For example, data is available on how fast rooms are cleaned and prepared, or how quickly patients are discharged and sent home – but only after following all the correct discharge protocols specified within the dashboard.

Being in a highly regulated environment with various compliance requirements, the hospital gets a boost from the dashboard when it comes to tracking regulatory item such as readmission rates and speed of patient discharge.

In an environment in which the industry is transitioning to value-based care, these key performance metrics are critical for hospitals and health systems.

Improved workflow. Fewer errors. Less duplication of effort. Improved compliance. Improved patient care. Better distribution of patient workloads. Within this system, powered by Corepoint Integration Engine, Cook Children's Healthcare System and its patients are reaping multiple benefits.

Case Study 2
Children's Hospitals and Clinics of Minnesota

Using Rhapsody to Future-proof Its Architecture with Modern and Flexible Interfaces

Children's Hospitals and Clinics of Minnesota (Children's) is one of the largest pediatric health systems in the United States, serving children throughout the Upper Midwest at two freestanding hospitals, 12 primary and specialty-care clinics, and six rehabilitation sites. An independent and not-for-profit system since 1924, Children's maintains its longstanding commitment to the community to improve children's health by providing high-quality, family-centered pediatric services and advancing those efforts through research and education. An award-winning health system, Children's is regularly ranked by US News & World Report as a top children's hospital and by The Leapfrog Group for its quality and efficiency.

An Integration Challenge

Children's was using a legacy integration engine to exchange information across multiple systems. Once it was determined that the product was being sunsetted, the organization decided to evaluate other integration engine solutions. As one of four pediatric hospitals in the Twin Cities metropolitan area, and red-lining in terms of capacity, the organization was eager to identify an integration solution that it could implement quickly and deliver data in the exact same format it had been using to allow for a smooth transition.

In searching for an integration engine partner, Children's also wanted to future-proof its existing architecture by adding modern and flexible interfaces and setting standards to match its existing workflows. Children's needed a solution to help migrate, manage and streamline message exchange between eighty departmental interfaces including ADT, orders, results and billing for radiology, laboratory, surgery and pharmacy departments.

A Powerful Back-end Integration Solution

Children's had adapted to working with an integration technology that was slow and cumbersome, so represented a paradigm shift for the organization.

Children's selected Rhapsody by Lyniate based on Lyniate's turnkey methodology for legacy conversion projects and the technology's capabilities:

- Quick to install, fast to configure, simple to deploy and easy to use
- Allows for real-time connectivity to Children's ninety-eight different connection points; streamlining processes, reducing operational costs and increasing network reliability
- Ability to build and deploy integrations in hours, without the need for advanced development skills, using Rhapsody's drag-and-drop

Case Study 2
Children's Hospitals and Clinics of Minnesota

and wizard-based tools
- Ease of upgrades
- Rhapsody bundled software with training and implementation services, providing the Children's IT team with the resources they needed to take control of the integration project and keep that valuable knowledge within the organization.

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Increased Productivity, Enhanced Workflow

Since implementing Rhapsody in 2010, Children's continues to see increased productivity across health information management, lab, pharmacy, and radiology departments. It has become simpler to pinpoint where data flow and transaction issues are occurring and to address them quickly.

Rhapsody enables Children's to streamline information sharing across 98 connection points, reducing the amount of resources needed to maintain interfaces. By eliminating software maintenance costs and resource time spent on non-strategic systems, Children's has also seen cost savings of $100K+/year.

Rhapsody has also enabled Children's to add a third server to support its disaster recovery preparedness; by creating additional redundancy, the hospital is able to ensure the safety of electronic patient data. Reports are now 100% accurate and created in the custom formats needed, eliminating the need for additional reporting resources.

381 beds in two cities

4,526 employees

90,673 emergency room visits annually

259,118 outpatient clinic visits annually

Case Study 2
Children's Hospitals and Clinics of Minnesota

Rhapsody's unit testing framework has also accelerated the Children's development and testing cycles. Rhapsody ensures effortless integration between Children's hospitals and its ambulatory locations, acting as a mapping and translating mediator between previously incompatible systems. Messages are reliably and accurately delivered regardless of the format or transportation type required. Rhapsody's drag-and-drop configuration allows complex routing and processing to be easily configured, and its powerful web-based monitoring tools enable fast and efficient resolution of issues and/or reprocessing of messages.

By using Rhapsody, they were able to successfully streamline message exchange between 80 departmental interfaces including ADT, orders, results and billing for radiology, laboratory, surgery and pharmacy departments.

> Rhapsody was the clear choice, having been both top in functionality and price point, while consistently rated as a top solution by KLAS and top marks from other customers.

JOE PINOTTI
Interface engineer Children's Hospital and Clinics of Minnesota


Photo by Alaric Sim on Unsplash

Case Study 3 **Children's of Alabama**

Using Corepoint to Reduce Alerts via Unique User Profiles and Web-Based Monitoring

The world of healthcare IT rarely sleeps. Critical data is exchanged around the clock so patients can receive the timely, urgent care they need. And if something halts or delays this process, an organization's resources, finances, and ability to deliver patient care can take a major hit. For an organization like Children's of Alabama, the third largest pediatric medical facility in the U.S., this is especially true.

Children's of Alabama ranks among the best pediatric medical centers in the nation, caring for children from across not only Alabama, but other states and foreign countries as well. They employ close to 4,000 people, and their IT department consists of 130 engineers who support over 100 clinical and financial systems for the organization. Needless to say, there is a lot of critical data flowing throughout the organization at any given time.

The Old Way

Originally, an analyst from network operations monitored the engine's interface display — among other things — and would notify an on-call intwegration engineer if any errors occurred after hours. While it seems straightforward, there were a number of drawbacks to the process.

For starters, the on-call integration engineer would often discover it was not an interface causing the error, but rather another system. When that was often the case, the integration engineer then had to notify the on-call application engineer of that particular system (e.g., lab or radiology) and explain the issue.

> We still have the same number of integration engineers here but they've expanded our role because we don't spend as much time on maintenance on the engine... I don't think there is one single person who doesn't see the value and the return on investment.
>
> **KENT SPRAGGINS**
> Integration engineer III

This approach was unproductive and time-consuming because there would be a delay in the integration engineer responding, as well as the added delay of trying to reach out to the appropriate person to address the issue.

Another frustration the integration team ran into was that they were being called after hours for a system that was not meant for 24/7 monitoring. The overall process was inefficient, but all that changed when Children's of Alabama began using Corepoint by Lyniate.

Case Study 3 **Children's of Alabama**

Unique User Profiles

The first step to addressing these problems was to customize the displays that operations monitored after hours. With Corepoint, administrators can create unique user profiles by filtering what others can see and what activities they can perform, so they customized the monitor to only display the connections that needed 24/7 monitoring. Because they were only seeing those with around-the-clock monitoring, there was no question whether to take action.

Tailoring the monitor greatly reduced the number of unnecessary calls the integration engineers received in the middle of the night, and it was as simple as checking or unchecking a box in the user profile configuration.

Web-based Monitoring

The next course of action was to extend monitor access to the different application engineers and ancillary teams. And because the monitor is web-based, there was no impact to running the engine with additional users accessing the monitor.

This was done, once again, by creating user profiles for different groups that only display the connections pertaining to their specific systems or applications.

Additionally, they set up alerts and email notifications for the individual or groups directly responsible for addressing specific systems' issues. This streamlined the support team's ability to contact the correct person and removed the Integration Engineers from being an in-between step.

Now if a 24/7 connection goes down for a certain time period, an alert will go off and send an email to the responsible party. And more times than not, they are already looking into the issue at that point.

What's Next?

Since moving away from the old way of doing things, the reduced response times and call volume has greatly enhanced the IT support at Children's of Alabama.

So, what's next? The team is exploring the option of replacing actively monitoring the engine with customized alerts to notify operations of any issues along with the details of who to contact.

> It was quite frustrating to be called in the middle of the night to log into a system and find out that it was a medical records system, or something of that nature, that was not even monitored 24 hours, and even worse, the support staff got conditioned and sometimes wouldn't call us on an interface that actually was monitored—and that would cause problems.
>
> **KENT SPRAGGINS**
> Integration engineer III

Case Study 3 **Children's of Alabama**

Approximately **4,000** employees

IT department consists of **130** engineers, supporting more than **100** clinical and financial systems for the organization

684,000 outpatient visits per year

15,000 inpatient admissions per year

Primary care is provided at more than **12** medical offices in communities across central Alabama

Photo by Annie Spratt on Unsplash

Case Study 4 **Phoenix Children's**

Using Rhapsody to Quickly Build Interfaces and Venture Into FHIR®

Phoenix Children's Hospital (Phoenix Children's) is the only hospital in Arizona dedicated to children and one of the 10 largest children's hospitals in the nation. Phoenix Children's is home to the state's largest group of pediatric specialists and sub-specialists. As the hospital continues to evolve this world-class care, its leaders working with top local and national research partners to uncover new breakthroughs in pediatric medicine.

Optimizing IT Resources

Phoenix Children's IT department was being asked by their clinicians, support staff, and researchers to provide a wider variety of services with limited resources. Beyond that, the hospital's legacy integration engine was increasingly proving to be too rigid for the organization's evolving demands.

Neither user-friendly nor scalable, the engine delivered messages with incomplete information, was unable to track the vast quantities of data coursing through the hospital's IT infrastructure and failed to offer the level of integration that Phoenix Children's needed.

"A clinician would ask me for the details of a patient encounter on a specific day, three years earlier," said Kevin Allen, the hospital's senior integration analyst, "and I would have to tell her that I was sorry, but that we only keep thirty days of information, since our integration engine didn't support a data warehouse.

That sort of dialogue was a regular occurrence, and it certainly didn't do any favors for the IT department's reputation within the Hospital." Additionally, the application team found themselves in an increasingly awkward position between their providers and their EHR vendor. Their EHR vendor was unable to accommodate requests to add fields and functionality Phoenix Children's needed to add data to downstream messages and execute other tasks related to patient care.

"When we asked the vendor to add a specific field, they couldn't, because not enough customers were asking for it. For just one field, to enter a single piece of data for an outbound message, the quotes would start at $5,000 and the vendor would propose a timetable of several months. That was unacceptable," said Allen.

"Ultimately, that lack of functionality was slowing down our processes and impacting patient care," he said.

A Faster Way to Build Interfaces, and Preparing for FHIR

Phoenix Children's interviewed the top interface-engine vendors and determined Rhapsody by Lynaite was best suited for their needs, including everything from connecting two communication points in fewer than 10 minutes, to advanced functions, like quickly collecting data from a myriad of databases. Offering fast and reliable

Case Study 4 **Phoenix Children's**

connectivity and data sharing within and among hospitals, Rhapsody is a platform that enables its users to:

- Build interfaces and deliver projects faster
- Extend the life and value of existing systems
- Adapt to the latest healthcare industry changes
- Give their staff the ability to solve complex problems
- Be confident in their infrastructure's uptime
- Reduce the time it takes to maintain systems
- Implement FHIR capabilities
- Simplify complex healthcare interoperability

The Results

Rhapsody solved multiple problems and ushered in a new era for Phoenix Children's. The hospital's IT department is now able to offer a level of flexibility and services never possible before. "As we started to use Rhapsody and migrate off our legacy interface engine, we discovered that it boasted capabilities that we had not even considered during our interface-engine selection process," Allen said. "We quickly learned we could help our application team by adding much-needed business logic and capture the data that our providers were asking for. We 'd be able to do all of it without paying extra set-up and maintenance fees."

In addition to enabling a high level of integration in a scalable, user-friendly environment, Rhapsody empowers the hospital's clinicians, support staff, and researchers to track and make sense of vast quantities of data, which now amounts to some one to three million messages per day.

"Now, whenever a Phoenix Children's clinician needs insight into a specific patient encounter, no matter what year it happened, I can run a query through the data warehouse and other routes via Rhapsody and bring real intelligence to their decision-making process. This means a profoundly improved level of care for patients," Allen said.

"The history captures gaps in care that would have been missed, at-risk patients who wouldn't have been promptly identified, and inefficiencies in our workflow that could've had a negative impact on patient well-being. Rhapsody has made a complete night-and-day difference in how we provide care at Phoenix Children's."

Further, Rhapsody has made it possible for the IT department to create a series of long-awaited custom applications that not only feed data into Rhapsody, but also pull data from a variety of sources in real time. "Instead of IT being seen as a roadblock, we're now seen as a facilitator," said Allen. "Instead of saying we can't offer the custom applications the hospital wants because it's too expensive or the engine won't allow it, we say, 'Whatever you want, we'll get it for you. We'll create it ourselves.'"

Case Study 4 **Phoenix Children's**

FHIR-Proofing

"With Rhapsody, we're now ready to accommodate the first vendor who wants to connect to Phoenix Children's using FHIR," said Allen. "By all accounts, FHIR is the future of healthcare data integration, and we're excited to have a partner like Rhapsody by our side as we venture into it."

Location: Phoenix, Arizona

Website: phoenixchildrens.org

Type of Hospital:
Pediatric, non-profit

Beds: **433**

Inpatient Visits Per Year: 12,248

Integration Engine: Rhapsody

Key Benefits:

- Enabled improved integration in a scalable, user-friendly environment
- Empowered hospital staff to track and make sense of vast quantities of data
- Made possible the creation of a series of long-awaited application enhancements
- Prepared the hospital to be ready to connect with HL7® FHIR® -enabled vendors

About **Lyniate**

Lyniate partners with healthcare organizations around the globe delivering cutting-edge solutions to address interoperability challenges. The company's industry-leading products, Corepoint and Rhapsody, are used by thousands of customers to send hundreds of millions of messages every day. Lyniate is committed to delivering the best interoperability solutions for healthcare organizations, from specialty clinics to large networks, from payers to vendors, and everything in between to build the future of interoperability.

About Corepoint and Rhapsody

Corepoint® Integration Engine and Rhapsody® Integration Engine are intended only for the electronic transfer, storage, or display of medical device data, or the electronic conversion of such data from one format to another in accordance with a preset specification as specified in the product manual and/or related documentation. Neither engine is intended to be used for active patient monitoring, controlling or altering the functions or parameters of any medical device, or any other purpose relating to data obtained directly or indirectly from a medical device other than the transfer, storage, and conversion of such data from one format to another in accordance with preset specifications.

Have a question about how Lyniate interoperability platforms could work in your environment? Ready for a demo?

We'd love to talk!

Drop us a line at Questions@Lyniate.com.

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