Case Study

Medical Device Integration across a Health System to Support Patient-Focused Care

NorthShore
University HealthSystem

NorthShore University HealthSystem is a comprehensive, fully integrated healthcare delivery system that comprises four hospitals based in the Chicago suburbs of Evanston, Glenview, Highland Park and Skokie.

NorthShore is a Stage 7 health system, as scored by the HIMSS Analytics EMR Adoption Model[SM] (EMRAM), which confirms that the health system: "no longer uses paper charts to deliver and manage patient care and has a mixture of discrete data, document images, and medical images within its EMR environment;" "data warehousing is being used to analyze patterns of clinical data to improve quality of care, patient safety, and care delivery efficiency;" "clinical information can be readily shared via standardized electronic transactions;" and "demonstrates summary data continuity for all hospital services."[1]

NorthShore University HealthSystem partnered with Nuvon—now Bernoulli—to deliver medical device connectivity and integration in order to provide enhanced quality of care and patient safety at the health system's four Chicagoland hospitals.

Northshore selected Bernoulli to:

Develop, deploy and implement medical device connectivity within critical areas of all four of the health system's hospitals, providing Northshore with a versatile platform that could manage multiple devices from multiple vendors, eliminate paper documentation, and allow clinical staff to focus more on the patient than the equipment.

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Bernoulli in partnership with NorthShore developed, deployed and implemented medical device connectivity within anesthesia and critical care areas, including surgical services in the Operating Rooms and supporting departments at all four of NorthShore's hospitals. Supporting departments include Gastroenterology, Catheterization Lab, Interventional Radiology, Computed Tomography, Labor and Delivery, and Pain Clinic.

The Challenge

As a HIMSS Analytics Level 7 hospital with a current Epic implementation, NorthShore University HealthSystem is committed to the quality of patient care and patient safety supported by the electronic sharing and use of patient data.

NorthShore had limited device integration to biophysical and non-biophysical monitors and their proprietary integration servers. NorthShore realized that it needed a platform that could manage multiple devices from multiple vendors, including non-system (networked) managed equipment to supply a single source of data from these sources.

"Transitioning the Anesthesia Department from paper to electronic documentation necessitated the need for a device integration solution to manage its particular needs," said Anne Wild, RN, BSN, MBAHCM, NorthShore's Health IT Implementation Manager. "Bernoulli was needed due to lack of standardization in data communication among disparate devices in the clinical areas."

With its Nuvon VEGA system, Bernoulli in partnership with NorthShore developed, deployed and implemented medical device connectivity within anesthesia and critical care areas, including surgical services in the Operating Rooms and supporting departments at all four of NorthShore's hospitals. Supporting departments include Gastroenterology, Catheterization Lab, Interventional Radiology, Computed Tomography, Labor and Delivery, and Pain Clinic.

The Solution

NorthShore needed a solution that was flexible for its needs today as well as tomorrow, and a partner who could meet the health system's aggressive implementation schedule.

"We chose [Nuvon] based on their platform's versatility, the simple architecture for the end-user, and their ability to integrate our existing medical devices and the amount of data that could be drawn from them," said Darlene Anjulo, CBET, NorthShore's CE-IT Project Manager. "

The platform's other benefits include the potential for barcode capability to connect through ADT, and its ability to run with wired and wireless options and connect multiple devices.

As part of the implementation, NorthShore and Nuvon deployed 11 device drivers related to anesthesia machines, physiologic monitors, specialty neurologic monitors, end-tidal CO_2 monitors, and others used in the management and care of patients ranging from coronary bypass grafting to endoscopic procedures and child birth.

"[Bernoulli] was confident that their engineers could build the drivers for the devices that we required to be integrated," said Anjulo, "and were able to deliver on that, allowing us to work within our existing health IT infrastructure."

Specifically for NorthShore, Bernoulli also provided the unique capability to cache at least 30 minutes' worth of buffered data in operating rooms, mitigating possible data gaps and promoting patient safety.

"We targeted those areas that had multiple devices that needed integration and/or a different biophysical monitor that could not be interfaced with our current gateway servers," said Wild. "Evaluations were completed in the Anesthesia and critical care areas to determine which devices were reported on in the EMR and which devices were capable of interfacing with the [Bernoulli] system. This included physiological, environmental, and settings from these devices."

The Results

"Successfully implementing medical device connectivity and interoperability in all four of NorthShore's hospitals within a tight time frame is an achievement of which we are very proud, and grateful for the opportunity to work with such an outstanding partner as NorthShore" said John Zaleski, PhD, CAP, CPHIMS, Chief Informatics Officer, Bernoulli. "We see NorthShore as a long term partner and are pleased that we can support them in an expansion later this year to intensive care units, emergency departments and hemodialysis units."

"We have gotten feedback from clinical staff that they can now concentrate more on their patients instead of the equipment," said Wild. "We are always looking for opportunities to cut out manual documentation that can be interfaced and validated by the clinician to save time and improve accuracy."

As a result of the Bernoulli Nuvon VEGA implementation, NorthShore's anesthesia department went from paper documentation to all electronic documentation with auto validation of vital signs, according to Anjulo.

"There were pain points that we needed to work through with device data confidence and electronic documentation confidence, but over time, electronic documentation has improved accuracy and efficiency over all," said Anjulo. "For the critical care areas, real time data flow into the record provides real time evaluation of situations that require immediate attention and post time documentation."

Unique Benefits of Bernoulli

Bernoulli's Nuvon VEGA platform delivers on its promise of accurate, real-time patient data, anytime, anywhere, because it is the only system that delivers these five unique benefits:

1. Best patient care outcomes with real-time synchronized patient data that are available wherever the patient is, and wherever the clinician is, on multiple platforms like workstations, tablets, or Smart phones.

2. Lowest overall cost of ownership, with a single system management controller that does not require expensive add-ons as the hospital expands connectivity.

3. Maximum reliability, with plug and play connectivity supporting the automatic identification patient care devices of any make and model, and a dashboard providing technicians with real-time monitoring and alerts so they can remotely address issues before the clinician realizes that a problem exists.

4. Highest level of patient data security and privacy, with data encrypted from the point of capture and throughout the transmission and data access protected by authentication.

5. An MDI platform integrated with rules and post-processing that enables creating new information, notifications, analysis and reports from the discrete data collected from the bedside.

Summary

Achieving medical device connectivity is a major initiative today for hospitals throughout the U.S. In order for clinicians to make the best patient care decisions, hospitals must ensure that their EMRs and clinical decision support systems contain meaningful and accurate data from the wide variety of devices that monitor patients. Currently, data from these multiple devices are often collected manually and then entered into the EMR, resulting in delays, time away from patient care, and potentially, errors that can jeopardize patient safety. In addition to having ready access to this real-time, synchronized patient data, clinicians must also be able to access this information at all times, and at any location.

With its Nuvon VEGA system, Bernoulli partnered with NorthShore to develop, deploy and implement medical device connectivity within critical areas of all four of the health system's hospitals, providing it with a versatile platform that could manage multiple devices from multiple vendors, eliminate paper documentation, and allow clinical staff to focus more on the patient than the equipment.

About Bernoulli

Founded in 1989 with headquarters in Milford, CT, Bernoulli is a leader in real-time connected healthcare, with more than 1,200 installed, operational systems. Bernoulli *One*™, the company's flagship platform, combines comprehensive and vendor-agnostic medical device integration with powerful middleware, clinical surveillance, telemedicine/virtual ICU, advanced alarm management, predictive analytics and robust distribution capabilities into ONE solution that empowers clinicians to drive better outcomes, improve the patient experience, and enhance provider workflow.

For more information please visit www.BernoulliHealth.com.

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1. HIMSS Analytics. Electronic Medical Record Adoption Model. Available at: www.himssanalytics.org/provider-solutions.

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