Santa Rosa
CONSULTING

A Case Study

Preparing the Enterprise for

Patient Care Device Integration

Inventory, Environment and Field Support

Virtua Health

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The Client

Virtua Health is a community healthcare system located in southern New Jersey. Its mission is to deliver a world class patient experience through its programs of excellence in women's health, children's health, cancer/oncology, cardiovascular health, neurosciences, orthopedics, surgery and wellness. In addition to its four acute care hospitals, Virtua provides comprehensive outpatient health and surgical services, a home care service, rehabilitation and nursing centers and a center for health fitness.

Virtua has been an innovator in healthcare on many levels. It was one of the first healthcare organizations to adopt process improvement tools developed by industrial companies to redefine 21st century patient care. Utilizing the Six Sigma and lean tool kits and internal consultants (e.g., Yellow Belts, Green Belts and Master Blacks), multi-disciplinary teams work on initiatives that focus on the organization's strategic imperatives to deliver the best quality of care.

The Information Technology Program

Virtua is committed to creating an integrated and interoperable electronic health information system to support its mission of care. During the next 2 - 4 years, Virtua will transition its current facilities to new state-of-the-art hospitals. They will be digitally based with complete electronic medical records, including technologies that will automatically record patient vital signs and other clinical data that is captured from bedside patient care devices (PCD).

The Objectives for Patient Care Device Integration

The automated flow of data from PCDs at the bedside to a clinical information system is a priority for several reasons:

- ***To increase patient safety***. Documentation errors are significantly reduced or eliminated with automated data collection versus manual transcription of data from scratch pads or by visually reading bedside devices. Safety is also enhanced by allowing the nurse to review data collected when he or she is not present in the room. Data can be captured at an increased frequency, creating a more accurate depiction of a patient's condition.

- ***To decrease documentation time.*** Significant increases in productivity are gained by an interface that allows the nurse and other care givers to validate rather than enter data.

- ***To support ongoing data collection when the clinician is not present at the bedside.*** Automation allows for a greater accumulation of data, thus providing a more accurate and valid history of patient progress.

- ***To improve patient care protocols.*** Data collected can be used for future analysis to modify clinical care protocols and benchmark best practices.

- ***To improve patient outcomes.*** Automated data capture allows care givers to provide better patient care and support of patient family needs.

- ***To reduce paper.*** Automation reduces the amount of paper, thereby streamlining healthcare system technology and making it easier to access and share data.

The Project

Santa Rosa Consulting conducted a series of readiness assessments to assist Virtua in staging an effective PCD integration program. Santa Rosa consultants analyzed Virtua's biomedical device inventory, patient care areas, biomedical networks, centralized Help Desk and distributed field support services. At the completion of the engagement, Santa Rosa presented Virtua with recommended action steps to optimize its environment for a successful implementation.

The Santa Rosa Team

Santa Rosa deployed a multi-disciplinary team including a biomedical engineer, a clinical analyst/registered nurse and IT analysts to conduct the assessments and present recommendations to Virtua's senior management, addressing biomedical engineering, information services and nursing issues.

The Approach

Inventory Validation

Santa Rosa's team physically examined approximately 2,800 devices to validate and update Virtua's inventory records to note device location, use and configuration. Santa Rosa then categorized all devices into unique makes and models to analyze device diversity and assist in developing a refresh strategy for Virtua's equipment.

Data Flow Analysis for PCD Data

Using Santa Rosa's industry experience and our comprehensive library of manufacturer contacts and documentation, the biomedical team identified the actual firmware version installed on each appropriate device in Virtua's inventory as well as the electronic output parameters available per device (i.e., what is displayed on the front of a device is not what is available for transmission from the back end). This information was catalogued in a data base tool to assist Virtua with ongoing PCD inventory management and to support interface development. Santa Rosa recommended replacements for older devices unable to produce electronic output parameters and upgrades to more recent firmware versions to provide a more robust electronic data set for PCD integration.

Environmental Assessment

The room configuration of Virtua's four acute care hospitals presented challenges for placement of data collection devices. Santa Rosa consultants observed and took digital photographs of all patient care areas to examine how bedside equipment is deployed, observed how nurses interact with patients and equipment at the bedside and noted the location of existing power sources and network connections. Santa Rosa presented a device placement plan for each patient room and intensive care unit to optimize space and connectivity without impacting bedside care.

Biomed Network Assessment

Santa Rosa evaluated the biomedical networks in all four hospitals to determine the types of networks (e.g., telemetry, central stations with gateways and without) and the status of those networks. The physical environment, power availability, failover, access and connectivity issues were analyzed. Recommendations to improve the environment were made to support PCD integration.

PCD Maintenance & Support Model

Utilizing structured interviews and work sessions with clinical, biomedical and information system personnel, the Santa Rosa team documented current procedures for supporting biomedical and IT devices in patient care areas and created a model for an integrated team approach to device troubleshooting and support. Recommendations included staff certification criteria, field deployment, governance and tools.

The Results

Virtua now has a structured set of tools and a roadmap for directing changes in its infrastructure to support an integrated PCD environment. Virtua also has a greater understanding of the scope and budget for coordinating biomedical, clinical and information system resources to achieve its objectives. With continuing support from Santa Rosa subject matter experts, Virtua is refining the roadmap for acquiring, deploying and supporting patient care devices, upgrading its inventory and preparing for data integration between devices and clinical applications. Detailed work plans proceed with interdisciplinary teams including but not limited to the following:

- Nursing and other clinical care providers
- Device driver developers
- Application and integration specialists
- Network specialists
- Biomedical engineering
- Centralized Help Desk
- Electricians and cabling technicians

As a result of the scale and success of this project, Virtua is well positioned for the successful adoption of patient care device integration across its enterprise.

"Santa Rosa's expertise in the area of bio-med device integration has been invaluable to Virtua in its quest to achieve high levels of data integration among our various technologies, all to enable the highest level of care to our patients."

Al Campanella, Vice President & Chief Information Officer, Virtua Health