IBM

Vassar Brothers Medical Center adapts to healthcare's challenges through mobile processes.
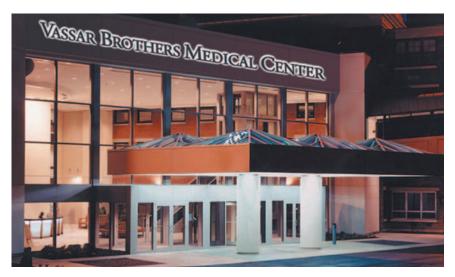
Overview

■ **Business Challenge**

With its operational challenges intensifying in the face of increasing demand for healthcare services, Vassar Brothers realized that it needed to fundamentally change — and ultimately optimize — its core processes. To enable this, the hospital needed to free itself of the restrictions of a fixed and fragmented infrastructure.

■ **Solution**

Working with IBM and its Business Partners InnerWireless and Vocera Communications, Vassar Brothers deployed a pervasive wireless infrastructure that enables the hospital to transform its process paradigm from fixed to mobile — increasing patient safety and operational efficiency.

■ **Key Benefits**

• 95 percent reduction in medication errors, representing between US$25 million and US$50 million in associated annual costs

• 20 percent increase in nurse productivity by virtue of mobility-enabled process improvements

• Improved asset utilization, enhanced patient safety and a reduction in future expenditures on IV pumps via real-time wireless tracking capability

Vassar Brothers Medical Center is a 365-bed facility that has been serving New York's Mid-Hudson Valley since 1887. Located on the banks of the Hudson River, Vassar Brothers has established centers of excellence in cardiac services, cancer care, and women and children's health services. Vassar Brothers is an affiliate of the Health Quest hospital system.

In the field of healthcare services, advanced medical research has aptly been viewed as the central weapon in the ongoing "war" against diseases. In recent years, the introduction of powerful information technology alongside classical clinical research techniques has already begun to deliver on the enormous promise that it holds in such key areas as gene therapy and oncology. By creating the foundation for a whole new way of treating illnesses, the marriage of IT in medical research has the potential to alter the very nature of healthcare delivery — and thus constitute a new weapon against disease. At the same time, however, the healthcare industry also faces a

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>
> – Daniel Aronzon, MD, president and CEO, Vassar Brothers Medical Center

Business Benefits

- 95 percent reduction in medication errors, representing between US$25 million and US$50 million in associated annual costs

- 20 percent increase in nurse productivity by virtue of mobility-enabled process improvements

- Improvement in overall quality of care and patient safety

- Improved asset utilization, enhanced patient safety and a reduction in future expenditures on IV pumps via real-time wireless tracking capability

- Improved overall ability to thrive in the emerging healthcare services marketplace

" We looked at the hospital and we saw that everything was in motion. Then we looked at the standardized processes and technologies in healthcare, and they were all based on static models."

– Nick Christiano, CIO of HealthServe Information Technologies

different kind of war – against lingering inefficiencies and rising costs – brought on by a tidal shift in demographics that will strain the nation's healthcare system to an unprecedented degree. Like an approaching storm on the horizon, the mass retirement of baby boomers, which will swell the ranks of the over-65 segment to nearly a quarter of the U.S. population, has so far provided just a hint of the turbulence it is expected to cause. Indeed, it's a foregone conclusion that the longer lifespans and increased demand for care among senior citizens will absorb a much greater share of healthcare resources.

Stemming a rising tide

But a capacity crunch is only half the problem for the healthcare system. The cost and funding issues spawned by this trend pose an even greater challenge. With the nation's annual healthcare spending already at US$1.5 trillion, a whopping 16 percent of GDP, the need to control costs has become absolutely critical. Seeking a way to stem escalating costs, the federal government – by far the largest payor in the healthcare system – has begun a qualitative shift in its reimbursement practices, the central mechanism for allocating resources across different healthcare providers. Employing free market principles, the emerging trend is to more closely tie reimbursement rates to quality and cost metrics. By rewarding providers based on their ability to "do more with less," this new formula aims to encourage providers to invest in the administrative and clinical innovations that will enable them to better compete in tomorrow's healthcare environment.

Vassar Brothers Medical Center (www.vassarbrothers.org) is one provider that has heeded the call. Located on the banks of the Hudson River in Poughkeepsie, the 365-bed facility is a key member of the Health Quest regional hospital network. While highly rated for quality and a leader in cardiovascular care, Vassar Brothers still faced the same capacity and cost challenges as the rest of the industry. What made Vassar Brothers stand out, however, was its rare combination of vision, leadership and a willingness to face the challenges head-on. Vassar Brothers' leaders viewed the trend toward accountability as not a problem to solve but an opportunity to adapt better than any of its competitors to the new environment. Its reasoning was simple: continuous improvements in measures such as clinical outcomes, patient safety and operating efficiency – combined with more transparency – will strengthen Vassar Brothers' place in tomorrow's healthcare environment. The same line of thinking also applied to the physicians on whom Vassar Brothers depended for patient admissions. Over time, Vassar Brothers had differentiated itself based on its quality of care. While this was a critical foundation, Vassar Brothers saw the opportunity to cement an even closer relationship with its physicians by providing them with access to the best systems, infrastructure and practices. Vassar Brothers knew what it would take to thrive in tomorrow's healthcare environment, and was ready to take action to make it happen.

Guided by the high priority it has long placed on patient safety, Vassar Brothers chose to focus its initial efforts on reducing errors in dispensing medication, a chronic and costly problem with many causes – from undetected interaction problems and unreadable handwriting scripts, to fatigue and human error. Known as Adverse Drug Events (ADEs), these dispensing errors were costly (costing as much as US$10,000 per incident, or US$1.3 million for a 300-bed hospital), disruptive and dangerous. To reduce the number of ADEs, Nick Christiano, CIO of HealthServe Information Technologies (the IT enterprise of Health Quest that serves Vassar Brothers and its sister institutions), proposed a reengineering of the entire prescription medication process, with the aim of making it seamless, efficient and consistent. To gain a more granular understanding of process requirements, Christiano and his team made a detailed assessment of the overall process flow, including communication patterns and the interdependencies between different clinical areas and personnel. Their review uncovered a process flow marked by discontinuities, distractions and the lack of standardization. It showed, for example, the extent to which nurses are required to go out of their way to access or share information in the course of their regular duties. It showed also how flaws in the way doctors ordered medication – ranging from illegible scripts to undetected adverse interactions – were a key source of adverse drug events.

Getting to mobile processes

Christiano's analysis also showed how the vast majority of the hospital's processes, and the personnel performing them, are in a near-constant state of motion. For employees to function at maximum efficiency, he reasoned, they needed tools, processes and an underlying infrastructure that were aligned with and optimized for this mobile environment. To get to this point, Vassar Brothers needed to correct the mismatch that existed between its current infrastructure – comprised of fixed terminals and wired telephony – and the mobility-enabled processes it sought to put in place. Christiano and his team saw a pervasive wireless communication infrastructure as the bridge to the hospital's future process framework. To put it in place, he turned to IBM Global Technology Services and its Business Partner InnerWireless.

Using InnerWireless' Wireless Utility In Building Wireless System, IBM designed a unified wireless infrastructure capable of handling all of Vassar Brothers' data and voice applications. Replacing the patchwork of fragmented wireless networks that had been in place, the solution provides a single broadband environment that supports both current and future wireless protocols for voice, data, telemetry and RFID applications. The inherent benefit of having a pervasive wireless solution spanning the entire hospital was immediately evident when Vassar Brothers deployed its new medication management processes – which employ wireless barcode technology – by essentially "plugging into" the new infrastructure.

Key Components

Services

• IBM Global Technology Services

Business Partners

• InnerWireless
• Vocera Communications

Time frame

• Meds barcoding initiative: 12 months
• Development of IV pump tracking pilot: 6 months

Why it matters

Vassar Brothers Medical Center sees mobility-enabled processes as the key to thriving in tomorrow's healthcare environment. To lay a foundation for it, the hospital built a pervasive wireless infrastructure on which it has begun to deploy redesigned and optimized processes. These include a wireless med barcoding system, which has drastically cut errors in administering medications, and an RFID-based solution to track and manage its clinical assets in real time anywhere in the hospital.

Under the new process, nursing staff use barcode devices to perform a three-way, real-time cross-check between patients, meds and the patients' medical files. In addition to real-time error detection, the solution also needed to enable bedside clinical staff to respond promptly and efficiently. To address this, IBM deployed a wireless Voice over IP communications system from its Business Partner Vocera Communications that enables nurses to contact the doctor or the pharmacy in real time from the patient's bedside without having to return to the nursing station. The results have been dramatic. In the first full year the system was in place, Vassar Brothers prevented over 5,000 medication errors, compared to just 244 in the year before. This implies a 95 percent reduction in errors, representing between US$25 and US$50 million in associated costs. Another key benefit is the hour and a half that the average nurse using the solution saves on each shift by being able to communicate in real time wherever he or she is.

The wisdom of Vassar Brothers' decision to deploy a pervasive wireless infrastructure became immediately evident in its next initiative, the use of active RFID technology to track the hospital's inventory IV pumps in real time. Using InnerWireless's Active RFID solution, known as Spot, IBM implemented a floor-by-floor pilot program that has thus far proven highly successful. Ultimately, it will sharply reduce the amount of time clinicians and staff spend searching for assets, and will give the hospital a more rational basis on which to procure and manage its inventory – with the ultimate benefits expected to include improved asset utilization, enhanced patient safety and a reduction in future expenditures on IV pumps. Dr. Daniel Aronzon, president and CEO of Vassar Brothers, believes the hospital is well positioned to compete in a healthcare environment where results and efficiency will be increasingly important. "For us, there is no more important goal than patient safety, and no more important task than improving processes to ensure it," says Dr. Aronzon. "With the help of IBM and its ecosystem of partners, we've come a long way toward that goal."

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