CUSTOMER SUCCESS STORY

CISCO HELPS BOSTON MEDICAL CENTER TRANSFORM TRADITIONAL NURSE CALL SYSTEM INTO REAL-TIME COMMUNICATION WITH PATIENTS

EXECUTIVE SUMMARY

CUSTOMER NAME

- Boston Medical Center

INDUSTRY

- Healthcare

BUSINESS CHALLENGE

- Out-of-date nurse call systems from two different vendors were inefficient and unreliable
- Noise from constant overhead paging was annoying to both patients and staff
- Old technology and lack of standardization impacted training, maintenance, and integration

NETWORK SOLUTION

- Cisco converged network supporting voice and data applications, based on Cisco switching, routing, Aironet® wireless access points, wireless IP phones with LCD displays, and integrated security.

BUSINESS VALUE

- Helps nursing staff to be more productive and responsive by transmitting patient requests directly to wireless IP phone display in real time
- Reduces noise levels by substantially reducing overhead paging
- Facilitates integration of nurse call system with other clinical applications and devices over IP network infrastructure

Boston Medical Center replaces out-of-date nurse call systems and enhances communications capabilities with a Cisco Medical-Grade Network that transmits alerts from patients' rooms to wireless IP phone displays, reducing noisy overhead paging and helping nurses to respond faster to patients' needs.

BUSINESS CHALLENGE

Boston Medical Center (BMC) is a 547-bed private, not-for-profit hospital and the primary teaching affiliate for Boston University School of Medicine. The hospital's mission is to "provide exceptional care without exception." For more than 854,000 patients that come through BMC's doors annually, the hospital is a vital safety net. About 50 percent of patients are uninsured or underinsured. More than 30 percent do not speak English. Nearly 40 percent of patients that come to the emergency department every year have no primary care provider. BMC's staff of more than 1300 nurses are dedicated to delivering quality patient care to all of BMC's patients.

BMC's commitment to its nursing staff is reflected in the fact that the turnover rate for nurses is less than 5 percent, compared with more than 12 percent statewide. BMC believes strongly in investing in technology and training to support higher levels of staff productivity and to aid the delivery of excellent patient care.

One of the systems that nurses depend on is the nurse call system. BMC was using two aging systems from two different vendors. Patients in need of assistance would press a call button at their bedside, which would cause a light to flash in their room and at the central station. A nurse walking by the patient's room might see the light, or a nurse at the central station would send an overhead page to find the nurse. The constant overhead paging was annoying to patients and nurses alike. "Noise pollution is a major concern for us," says Darren Dworkin, the hospital's chief technology officer. "Overhead pages impact our ability to maintain tranquility in the units." It was also easy for pages to be missed or misunderstood by busy nurses.

"Our old systems were inefficient," says Dworkin. "Plus, the systems couldn't interface with our electronic ordering system, or with some of our bedside clinical devices." Dworkin did not want to simply update the existing nurse call system and standardize vendors. Instead, he had a more far-ranging vision to give the nursing staff real-time communication with patients, provide nurses with the information they need to be more responsive and proactive, and provide the foundation to integrate other systems and devices.

NETWORK SOLUTION

Four years ago, BMC upgraded its network infrastructure to support a new computer-based physician order entry (CPOE) system, making BMC one of the first in the United States to fully implement such a system. The hospital deployed Cisco® Aironet® 1200 Series access points across the campus, delivering 100 Mbps wireless connectivity to the CPOE, with a high-capacity, redundant core connecting all 22 campus buildings. Two years ago, Dworkin's team extended the wireless network directly to the bedside, helping BMC to bring new applications, such as an electronic medical administration record (EMAR), directly into a patient's room.

Dworkin wanted the new nurse call system to take advantage of the hospital's wireless infrastructure. However, the two vendors that responded to the RFP quoted a separate wireless phone system based on RF technology. "We believe strongly in convergence, and we did not want to install an entirely new wireless infrastructure for a voice application," says Dworkin. "We wanted to extend our robust Cisco 802.11 to voice communications."

Dworkin asked both of the nurse call equipment vendors to requote their solutions in partnership with Cisco Systems®. "We selected Rauland-Borg as the vendor for the nurse call system and Cisco provided a solution with Rauland-Borg and Emergin Technologies, who provided the middleware between the nurse call system and Cisco CallManager call-processing software."

Dworkin also credits Cisco with expanding the vision for the new system by proposing that the hospital equip nurses with Cisco 7920 wireless IP phones, which look like cell phones with liquid crystal displays (LCDs). Cisco, Rauland-Borg, and Emergin collaborated with BMC to create an Extensible Markup Language (XML)-based application that captures and transmits all of the requests and alarms from the Rauland-Borg system and displays the information on the nurse's IP phone in real time. The nurse can look at the display and see the room, the bed number, and the nature of each patient's request. There is also a built in backup so that if the nurse does not respond to the call, the alert is routed back to the central station.

"We originally considered giving the clinicians personal pagers, but they end up getting paged constantly, can't tell why someone is calling, and often waste time playing telephone tag," says Dworkin. "Using Cisco wireless IP phones gave us the ability to put a real-time communications device directly in the hands of nurses for the first time." During the pilot phase, about 20 clinicians were given Cisco wireless IP phones; when the system is fully deployed across the campus, about 300 clinicians will be equipped with Cisco wireless IP phones.

One of the reasons Dworkin chose Cisco for the original campus-wide wired and wireless infrastructure was to provide the foundation for adding voice and other services without having to rebuild the network from scratch. Cisco quality of service is used to prioritize bandwidth over the network, ensuring that adding voice does not degrade the existing data applications. Another reason that Dworkin standardized on Cisco is security. For Dworkin, security means two things: guarding against security breaches that can disrupt the network and affect delivery of services, and protecting patient confidentiality. "We wouldn't have even talked with Cisco about wireless if we didn't feel they could offer us a secure solution. Cisco security is embedded throughout the network."

Networked Information Systems (NIS) of Woburn, Massachusetts, conducted the wireless site survey for the pilot project, mapping out the optimum coverage and eliminating any signal conflicts between access points as nurses moved throughout the unit. About 15 additional wireless access points were added for the pilot project; another 120 will be deployed throughout the campus to fully implement the nurse call system. BMC used Cisco Catalyst switches with inline power, which allowed them to install access points in the best locations without requiring separate electrical lines to provide power. Cisco CallManagers are deployed at each end of the BMC campus, to help ensure redundancy and resiliency.

BUSINESS VALUE

Prior to the new system, nurses who heard their names paged wasted valuable time racing back to a patient's room to determine the problem. Now, when the nurse receives a page, he or she can see the nature of the request and immediately address the problem. Overhead paging has been virtually eliminated. "We expect to see a significant reduction in the number of repeat pages and calls because patients will reach the right person the first time," says Dworkin.

Even physicians are benefiting from the new nurse call system. “Physicians have told us that they are able to locate nurses more quickly with the new system,” says Dworkin. “In fact, we’ve had quite a few physicians express interest in having Cisco wireless IP phones themselves.”

According to Dworkin, the IT department could have deployed the new nurse call system campus wide in only three months, but they purposely slowed the rollout schedule to allow time for training. “We’ve been surprised and gratified to see how extraordinarily well the system has been received. We thought it would take time to convince nurses about the benefit of the new technology and for them accept it,” he says. “But they grasped it almost immediately and fell in love with it.” Once the system is deployed throughout the campus, the wireless IP phones will help secure, intercampus roaming, allowing nurses to receive alerts regardless of their location.

“Using Cisco wireless IP phones gave us the ability to put a real-time communications device directly in the hands of nurses for the first time.”

— Darren Dworkin, Chief Technology Officer, Boston Medical Center

“This solution is about delivering information directly to the caregiver to allow them to be more responsive to patients,” says Dworkin. “Our nursing staff appreciates that we are investing in systems to help them provide better patient care.”

NEXT STEPS

This solution gives BMC virtually unlimited potential in terms of the type of information nurses can receive. One example is the ability to integrate alarms from clinical devices in the patient’s room, such as ventilators and I/V pumps. Rather than sounding an audible alarm in the room, the alert would be generated directly on the phone. Another capability Dworkin envisions is having abnormal (critically high or low) lab results automatically trigger an alert on the nurse’s wireless IP phone, rather than waiting for him or her to check the patient’s electronic medical record.

BMC also anticipates being able to transmit data from the wireless IP phone— transforming the phone from a communications device to a fully equipped computing device. This, in turn, will help BMC to incorporate capabilities like radio frequency identification (RFID) and other tracking technologies. “We know that we will continue to converge information over our network, and Cisco has given us the infrastructure to do that,” says Dworkin.

FOR MORE INFORMATION

Cisco Systems has helped healthcare organizations worldwide transform their clinical and administrative operations, and help enable new efficiencies that benefit both patients and staff. To find out how the Cisco Medical-Grade Network can help your organization, contact your local account representative, or visit: www.cisco.com/go/healthcare.

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the

Cisco.com Website at www.cisco.com/go/offices.

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Cyprus • Czech Republic Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

70118-2/AT/EL/2.05