

University of Colorado Hospital



Customer

- University of Colorado Hospital

Industry

- Healthcare

Challenges

- Inefficient wireless handsets
- Disparate technology environments
- Non-redundant middleware
- Cost-prohibitive migration

Solution

- NEC Unified Clinical Communications Solution
- Nurse-Call Middleware Integration
- NEC Professional Services
- Nurse-Call Middleware: Cisco® Nurse Connect
- Wireless Handsets: Cisco Unified Wireless IP Phone 7925G

Results

- Phased, flexible migration
- Seamlessly integrated systems
- Enhanced middleware platform
- Full redundant environment
- Improved nurse productivity

Hospital nurse-call systems are becoming increasingly critical to patient care and safety as the decade-long nursing shortage persists within the US healthcare system. By partnering with a technology provider capable of customizing and integrating the various technologies that support the nurse-call system, hospitals can improve efficiency, offset increased workloads and enhance patient-care delivery.

The University of Colorado Hospital (UCH), one of the Rocky Mountain region's leading academic medical centers, is recognized by US News & World Report as one of the best in the country. The hospital's earned Magnet status from the American Nurses Credentialing Center positions it among the top four percent in the nation for nursing excellence, clinical care and innovation. UCH leveraged NEC's Unified Clinical Communications Solutions to customize and seamlessly integrate key components of its nurse-call system, improving nurse communication and productivity; and increasing patient safety and quality of care.

Challenge

Mobile communication is critical to the more than 1200 nurses who work throughout UCH's central Anschutz Medical Campus in Aurora. UCH's nurse-call system allows patients to use their bedside, nurse-call button to request assistance. To enable mobility, the system requires a middleware solution as well as wireless handsets for caregivers. The nurse-call system collects and sends the message to the middleware, which in turn, routes a call directly to caregivers' wireless handsets. If the assigned caregiver cannot take the call, the middleware then routes the call to other caregivers within the inpatient unit.

"Our goal is for the patient to connect with a live person who can address their questions and provide assistance," says Joe Bajek, chief technology officer, University of Colorado Hospital.

Challenge (Cont.)

The hospital's legacy nurse-call system posed a number of challenges. "The nurses were unsatisfied with their wireless handsets," says Joe Bajek, chief technology officer, University of Colorado Hospital. "The phones had short battery life, very limited features and were cumbersome to use." The phones also lacked a storage feature, so nurses carried around handwritten lists of contacts in order to locate important phone numbers while they were away from the nursing station.

To find the best replacement, the hospital launched a pilot where nurses tested handsets from various manufacturers. When the nursing staff decided on the Cisco Unified Wireless IP Phone 7925G, another challenge arose. "The Cisco phones required a Cisco Call Manager but the hospital's existing call-processing system was NEC-based technology," says Bajek. "We needed to seamlessly integrate the two technologies without creating an overly complex telephony environment that would be costly and difficult to support."

UCH's existing middleware solution was unable to support the old and new wireless handsets simultaneously. As a result, implementing the new equipment would require a forklift upgrade, which would cause a huge disruption in hospital operations as well as patient care. The hospital needed a middleware platform that allowed the nursing staff to migrate to the new phones over time, in a most cost-effective, patient-conscious way. The new middleware would also need to address other issues the hospital had with its existing solutions. "Our improved middleware platform would need to improve redundancy, operational use and integration," adds Bajek.

Solution

UCH leveraged NEC's Unified Clinical Communications Solutions (UCCS) to respond to the hospital's challenge. As the hospital's communications provider for many years, NEC connects the hospital's three buildings at the Anschutz Medical Campus to its six other specialty clinics around the Denver metro area. "NEC has maintained a strong partnership with us for more than a decade," says Bajek. "They thoroughly understand our communications architecture and how it relates to the products and services we deliver to our customers."

UCCS is NEC's comprehensive suite of wireless communications services and solutions for the healthcare industry. Under the UCCS umbrella, NEC offers nurse-call middleware integration to seamlessly connect all the components of a hospital's nurse-call system.

As a part of its integration services, NEC uses Cisco Nurse Connect middleware to connect hospitals' nurse-call systems and wireless devices. NEC helps hospitals seamlessly integrate the Cisco Nurse Connect solution with any TAP-based, patient-alert notification system, paging system, wired endpoints, and various Cisco wireless IP devices. This solution can integrate with virtually any PBX.

NEC worked collaboratively with Cisco and industry-leader, Radianta, to design a customized, middleware solution for UCH. The core Cisco Nurse Connect solution is built within the Cisco Unified Application Environment (CUAE). Leveraging this CUAE-based development environment and deployment platform, the middleware seamlessly integrates with the Cisco Unified Wireless IP Phone 7925G and is extensible to a wide variety of other applications.

NEC engineers then worked with application developers to configure a pass-through capability for the Cisco Nurse Connect solution to allow the old and new middleware to co-exist. With the pass-through feature, all patient alerts were sent directly to the Cisco Nurse Connect solution. If the assigned nurse has an active 7925G phone extension, the Nurse Connect solution sends the message to the corresponding wireless, IP phone. If the assigned nurse did not have an active 7925G phone extension, the Nurse Connect solution passes the alert through to the original middleware, which then forwards the alert to the original wireless handset.

With NEC's pass-through configurations, the Cisco Nurse Connect solution allowed UCH the flexibility to successfully migrate to the new IP wireless phones in phases, eliminating the risk and expense of a forklift upgrade. It also enabled a flexible deployment. "In some cases, we were shifting the rollout schedule on an hourly basis in order to accommodate patient census and acuity needs," says Bajek. "If a unit was scheduled for rollout, but had just admitted critical-care patients, we were able to move on and come back to it later. This flexibility allowed UCH to maintain a very tight deployment schedule and timely project completion."

NEC also configured a feature for UCH's Cisco Call Manager that gives nurses access to the hospital's phone directories. Because NEC worked directly with the nursing staff to create customized directories for each unit, nurses easily locate the phone numbers they need from the new, wireless IP phone.

NEC's configurations also enable specialized grouping capabilities that improve patient care and satisfaction. At the beginning of each shift, nurses sign into the nurse-call system, enter their wireless, IP phone extension and the rooms of their assigned patients. When patients use their bedside device to request assistance, the alert notification goes directly to the assigned nurse and care team. Nurses can view patient call-back information and dial back the patient's bedside device by simply pressing the callback button on their phones. Additionally, emergent alerts such as a code call or a patient exiting a bed unassisted can be sent immediately to all phones on the unit via the group function.

Solution (Cont.)

The new solution greatly reduces excessive walking; giving nurses more time to spend with patients and families. “As a facility that is patient-family centered, our care delivery models include familiarizing families with patients’ care plan—both in the hospital and once patients are released,” says Bajek. “The improved nurse-call system gives nurses more direct contact with patients and their families, which drastically improves patient outcomes.”

Results

The enhancements to UCH’s nurse-call system support better patient-care delivery. “The opportunity to improve our middleware platform was significant for UCH, says Bajek. “The nurse-call functionality greatly contributes to our ability to deliver quality patient care, improve patient satisfaction and contributes to overall caregiver workflow and efficiency.”

NEC’s configurations for the Cisco Nurse Connect solution also provide UCH with a fully redundant, high-availability platform. “Nurse-call systems are classified, life-safety devices, so we’d like to keep all the equipment that augment the system in a data center-quality facility,” said Bajek. “Our old TAP-based alert-notification system required a hard-wire, point-to-point cable connection with its middleware server; so, we had to keep our old middleware solution in a wiring closet.”

With the Cisco Nurse Connect solution running on the CUAE platform in the hospital’s main datacenter, messages from the alert-notification system are sent over the hospital’s existing wireless network. “We can now keep the Nurse Connect server in the datacenter, where we can better support and manage it,” says Bajek. “We can also put another server in one of our other communication centers for redundancy.”

Bajek is happy with the first phase of the project. “The implementation phase of this project has been hugely successful for us,” says Bajek. “Some of the success is attributed specifically to the new, wireless IP phones, some of it is attributed to the Cisco Nurse Connect solution, but we definitely couldn’t have done it without NEC at our side.”

UCH is preparing for the second phase of the project. “We are looking forward to working with NEC and Cisco/Radianta to further tie their new, IP wireless phones and middleware solution to create more advanced functionality to improve nurse productivity and patient care outcomes,” Bajek concludes.

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