



Transforming Patient Care with Enhanced Care Team Communications

Nemours Children's Health System pairs clinical mobility with centralized monitoring to deliver unparalleled levels of patient care.

Challenge

Nemours Children's Health System wanted to implement a clinical mobility solution that would quickly deliver the right information to the right caregiver at the right time thereby allowing Nemours to streamline patient care and reduce alarm fatigue. But the consumer smartphones it initially implemented were not durable enough for the healthcare environment, resulting in connectivity, breakage and other usability issues that limited the organization's ability to improve patient care.

Solution

Nemours replaced its consumer devices with Zebra's TC51-HC touch computer. The devices give healthcare workers all the functionality they need to tackle virtually any task – without compromising on patient privacy or data security. Armed with the TC51-HC touch computers and Voalte Platform for care team communications, paramedics in the Nemours Clinical Logistics Center are more efficiently monitoring and caring for patients, managing alarms and communicating with nurses and staff.

The TC51-HC sets the bar in its class for rugged design, screen functionality and size, barcode scanning performance, battery capacity, camera resolution, power, memory and data storage – all in a housing created with the industry's most resilient medical-grade plastics. Voalte Platform simplifies nurse and physician communication and equips Nemours' IT team with the tools to manage, analyze and integrate mobile health technologies across the organization.

Result

The Zebra and Voalte-enabled mobile communications have empowered the Nemours' staff to improve patient care and efficiency in its two hospitals. Paramedics that are engaged in remote patient monitoring from the Clinical Logistics Center are able to quickly alert the nursing staff, via the TC51-HC through Voalte Platform, to potentially dangerous health issues ranging from arrhythmia to low-oxygen levels and ensure these critical alarms are quickly addressed at the bedside.



Photo by Jeff Leimbach

SUMMARY



Children's Health System

Customer

Nemours Children's Health System

Partner

Voalte
Sarasota, Florida

Industry

Healthcare

Challenge

- Consumer-grade smartphones were not durable enough for healthcare, resulting in connectivity, breakage and usability issues
- Streamline caregiver communications
- Reduce alarm fatigue

Solution

- Healthcare-grade TC51-HC touch computers are easier to clean, sanitize and manage, ensure greater uptime, decreased breakage and battery life that lasts an entire shift
- Voalte Platform for care team communications

Results

- Patients receive life-saving care faster
- Clinicians can better monitor patients, and communicate more effectively
- Patient flow is streamlined, freeing up beds more quickly

An Innovative Approach to Healthcare

Nemours Children's Health System has one critical mission: To restore and improve the health of children regardless of their ability to pay. The organization cares for more than 400,000 unique patients every year at its two hospital campuses, the Nemours/Alfred I. duPont Hospital for Children in Wilmington, Delaware and the Nemours Children's Hospital in Orlando, Florida.

A few decades ago, the organization took a hard look at how it might improve patient care and decided to try an entirely new approach – one modeled after the communication and monitoring systems used by air traffic controllers and NASA's Mission Control Center.

Nemours built a centralized, high-tech Clinical Logistics Center (CLC) where trained paramedics monitor the health of 400 patients in both hospitals 24 hours a day, 7 days a week. Guided by protocol-driven responses, the paramedics remotely monitor patient health, manage alarm escalation and redundancy and communicate with patients when needed. The paramedics are trained to monitor and react to conditions, such as bloodstream infections, catheter-associated urinary tract infections, and neonatal sepsis, which are automatically tracked by tapping into the patient's electronic medical records (EMR).

Several years ago, Nemours decided to arm both the paramedics and its caregiving staff with mobile devices, with the goal of improving communication between caregivers and paramedics and optimizing patient care.

Why Hospitals Need Hospital-Grade Devices

Initially, Nemours outfitted its healthcare staff with consumer-grade devices. They soon discovered, however, that their smartphones were not well suited for the healthcare environment.

The consumer devices employed by Nemours broke easily, resulting in unexpected downtime and higher capital costs because of the need to purchase a large number of spares. The consumer devices also had integrated batteries that did not last a full shift. Users were unable to swap out batteries. The smartphones were difficult to clean and sanitize which made them potential carriers for bacteria often linked to hospital-acquired infections.

Finally, the consumer devices did not contain an enterprise-grade Wi-Fi radio, which meant that connectivity was deficient in many areas of the hospital. Nemours started looking for a new solution and turned to Zebra's TC51-HC mobile computers to support its enterprise-communications needs.

Better Durability, Reliability and Functionality

"We made the decision to purchase the Zebra TC51-HC mobile device because it is a hospital-grade device that is very durable, very easy to clean and has more capabilities than the previous device we had used," said James Schnatterer, health informatics supervisor at Nemours Children's Health System. "The Zebra TC51-HC is like a handheld computer. It can do a lot more than your typical consumer device."

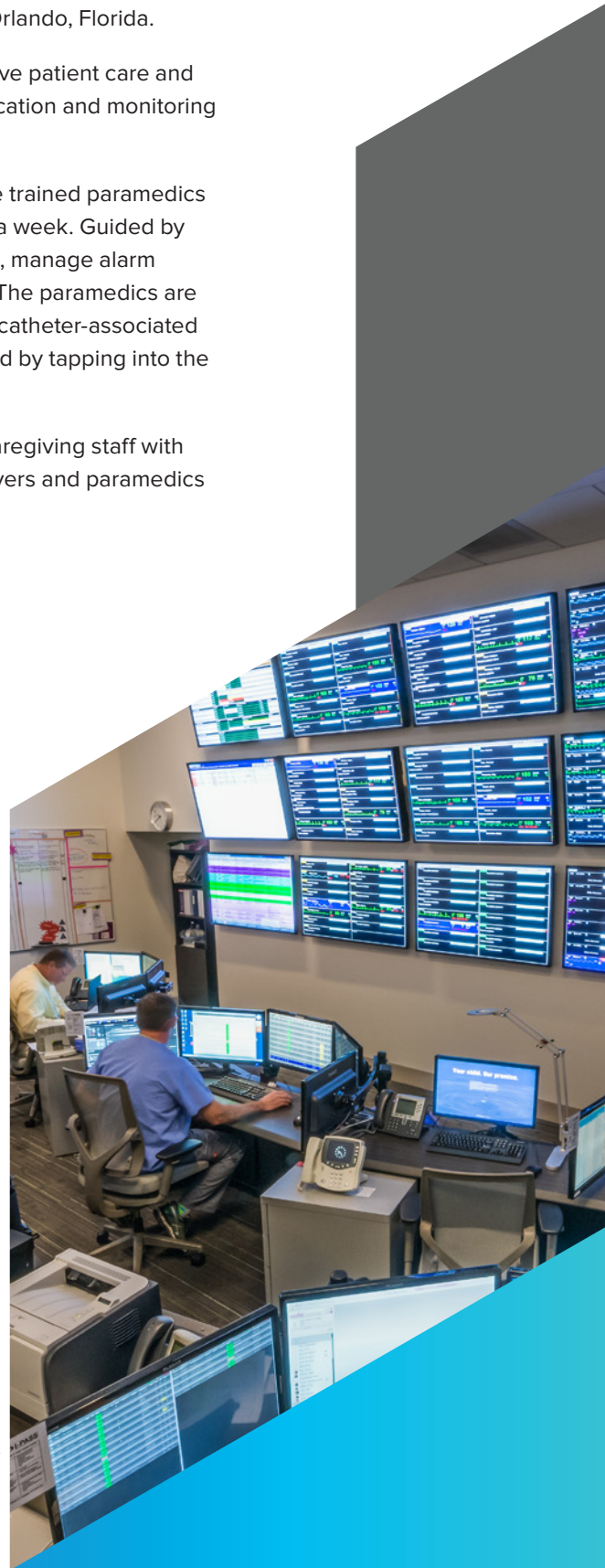


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"The staff absolutely loves it because it's very durable," he said, adding that the number of tickets they received for broken devices plummeted after deploying the Zebra devices. Device theft has also gone down given that the TC51-HC is designed specifically for the rigors of the healthcare environment.

The Nemours' staff also appreciates the long battery life on the TC51-HC – the device can hold a charge for 12 hours – which covers the length of a full shift. "They hand it off to the next person, switch the battery and then it lasts for the next shift," Schnatterer said. "Plus they can use any of their cleaners on the floor to sanitize these devices without worrying about harming them in any way."

In stark contrast to the consumer smartphones previously employed, the Zebra devices have no trouble staying connected to the Wi-Fi network within the Nemours healthcare facilities, therefore ensuring that critical patient-related communications are always promptly delivered.

The Zebra devices support built-in barcode scanning and data capture features, which help streamline patient identification and improve patient care and safety. These features also allow Nemours to easily remain in compliance with computer security standards established by the U.S. government.

Finally, the Zebra devices are "future-proof" in that they combine the benefits of enterprise-grade ruggedness with an application-friendly Android™ operating system. The TC51-HC's operating system allows Nemours to easily add new Android-based applications on the devices – which increases their return on investment (ROI) as new applications become available.

Nemours also relies on Zebra for service and support, which has virtually eliminated device downtime. If a TC51-HC needs any type of repair, Zebra overnights a spare device preset with the Nemours' specific operating system which allows IT to quickly complete provisioning onsite. Working with Zebra enables Nemours to control operating system upgrades and pre-certify that the OS upgrade will not affect its applications.

According to KLAS Research, Nemours is just one of many healthcare facilities that have chosen to deploy healthcare-grade Zebra devices rather than consumer-grade smartphones – and for good reason.

RESULT #1: Reduced Alarm Fatigue

Today, more than 700 paramedics and caregivers in the Nemours organization use the Zebra TC51-HC touch computers to quickly share critical information. From January through August of 2018, Nemours sent over 5 million text messages and made over 400,000 phone calls to caregivers' mobile devices.



There's a Real Difference

"The Zebra phones run on the Android operating system and address many of the concerns that healthcare organizations have with [consumer-grade smartphones]. The Zebra phones come with a built-in barcode scanner. They also have great battery life, and the battery can be swapped out if needed. Additionally, in terms of durability, Zebra phones are seen as healthcare-grade devices and can withstand drops with little damage."

KLAS Research Report,
Clinical Mobility 2018

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These communications have helped Nemours reduce alarm fatigue, which is a considerable challenge in patient care. In today's technology-enhanced world, clinicians are bombarded by alarms every 92 seconds.¹ While the alarms are meant to improve patient safety, the sad truth is that up to 99 percent of patient alarms don't require any action at the bedside.² Thus they merely reduce caregiver efficiency rather than improve patient care. The challenge is deciphering the critical alarms that require immediate attention from the informational alarms.

Thanks to the Zebra devices, Nemours CLC paramedics now forward only critical alarms to nurses' mobile devices, and the alarm escalation process allows nurses to escalate an alarm if they are not available immediately. If a nurse takes the call, it automatically stops the escalation process. If there is no response, the alarm will automatically escalate to the charge nurse or the CLC paramedics within 30 seconds.

Nurses and CLC paramedics can text each other or talk live, and nurses can use their Zebra mobile devices to call directly into the patient room when they receive an alert. The CLC paramedics monitor room activity via high-definition video, and, if required, can communicate directly with the patient and families in the room. CLC paramedics can also send group messages, for instance, when a patient needs attention, when equipment is malfunctioning or when an inspector is on site.

RESULT #2: Improving Patient Flow

Nemours also uses Zebra mobile devices to improve the efficiency of patient-care processes such as room turnover. The staff now tracks room readiness using four buttons on the TC51-HC, which delivers immediate updates to key personnel:

- 1. Room Dirty:** Notifies the cleaning staff when patient and family have left the room.
- 2. Cleaning in Progress:** Alerts the hospital's Environmental Services management that cleaning is in progress.
- 3. Room Clean:** Reports to Environmental Services management and patient care technicians that cleaning is complete.
- 4. Room Ready:** Informs the charge nurse, the house supervisor and CLC paramedics that the room is ready for the next patient.

RESULT #3: Higher Staff Satisfaction

"The use of texting has been overwhelmingly well-received by our nurses and staff," said Bernie Rice, vice president and CIO at Nemours Children's Hospital.

According to Shirley Garcia, a registered nurse in the Cardiac Intensive Care Unit, the new system "has helped improve communications by

¹HFMA, Extending the Care Team Through Technology

²NursingCenter, Alarm Fatigue: A Patient Safety Concern

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improving our patient care and by facilitating communications through all areas of the hospital.”

This approach to communications allows the patient’s clinical care team “to work together seamlessly throughout the day regardless of where they are at the moment,” said David West, MD and medical director of health informatics at Nemours. “There’s no more need to be geographically in the same place to work together as a team and have the best information available to make the best decisions for the benefit of the patient.”

RESULT #4: More Responsive, Cost-Effective Patient Care

“The number one goal of our Clinical Logistics Center is to get the patient the help they need exactly when they need it, and that is what we have seen happen time after time,” Schnatterer said.

According to Schnatterer, Nemours saves about \$6 per patient per day because nurses no longer spend their time tracking down false alarms – which represents one out of every five alarms, according to estimates from Nemours.

And reducing the burden on nurses’ time can be important, given that a 2018 study in the *Journal of Nursing Administration* found that just one additional hour of work reduces a nurse’s ability to collaborate with other healthcare staff.

But most importantly, the improvement in patient care has been immeasurable. Medics have caught seizures when no one else was in the room – and quickly sent caregivers to assist. The monitoring protocols have triggered early interventions that have helped at-risk patients get surgery without delay. Adverse reactions to blood transfusions have been detected and stopped quickly thanks to early detection and better staff communication. And simple texts to the nursing staff pointing out lead placement or rhythm changes have resulted in much-needed interventions.

“All of that clinical data is now able to identify patients at risk far earlier than we used to be able to do so,” said West. “And not only detect risk but tell somebody about it.”



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James Schnatterer,
Health Informatics
Supervisor, Nemours
Children’s Health System

To learn more about how Zebra’s healthcare-grade devices can help your organization improve communications and operation efficiency, visit www.zebra.com/healthcare



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