Mobile Device Convergence in Healthcare

Introduction

Smartphones have transformed the way healthcare providers communicate, and these mobile devices are poised to revolutionize the way hospitals deliver care in 2014 and beyond.

Texting long ago surpassed voice calls as the favored method of communication among the general population, and it is rapidly gaining favor in hospitals. Doctors and nurses already exchange patient-related texts on their own personal phones at many facilities, and as more hospitals issue mobile devices to employees, the ability to communicate quickly and access and update patient data on the move has become a critical function.

Deploying mobile, flexible, and reliable IT tools to caregivers is a top priority for provider organizations that not only need to meet new regulatory and technology requirements, but want to do so efficiently. At Cedars-Sinai Hospital in California, for example, the combination of smartphones and a new software solution to help prioritize alarms resulted in faster response times for emergency conditions, and a 50 percent reduction in overhead pages. Laboratory values are received 10 minutes faster and nurses are able to spend more time at the bedsides of patients

Texting the doctor from the bedside

Smartphones allow faster response to telemetry alarms

who require their attention, according to a case study published by the Robert Wood Johnson Foundation[1].

The passage of the The Health Insurance Portability and Accountability Act (HIPAA), Health Information Technology for Economic and Clinical Health (HITECH) Act, and the Patient Protection and Affordable Care Act (PPACA, or ACA) have established new incentives to promote technology adoption, and created new regulations related to outcomes, patient safety, and documentation. In response, hospitals and other healthcare facilities have deployed a dizzying array of technology, from electronic medical record (EMR) systems and networked medical monitoring devices, to bar code scanners for medication administration at the bedside and hospital-provided mobile phones to improve team communication. While these efforts have provided improvements in patient safety and

[1]Technology at Cedars-Sinai Hospital | RWJF Initiative on the Future of Nursing. (n.d.). Technology at Cedars-Sinai Hospital | RWJF Initiative on the Future of Nursing. Retrieved July 31, 2014, from http://thefutureofnursing.org/resource/detail/technology-cedars-sinai-hospital

Voice calls between care team members

Regardless of whether the facility deploys a purpose-built device or iPhones equipped with scanning sleds, the benefits of deploying one mobile device that allows the nursing staff to interact with doctors, patients, other nurses, and a full suite of patient care and messaging applications can both improve patient care and staff efficiency, while simultaneously improving the overall work environment.

Disinfectant-ready devices are required

data sharing, they have also produced a patchwork of point solutions and a belt-full of hardware (pagers, pendants, VOIP phones, scanners) for nurses and doctors to carry. In the case of EMR systems, these technology initiatives have also produced complaints from caregivers that they are tethered to desktops or bulky workstations on wheels (WOWs) in order to update patient charts and view test results.

For nurses, this onslaught of new technology has only added to the stress and occasional chaos of the hospital floor. As an increasing number of electronic medical devices have been added to hospital rooms to help monitor patient vitals and deliver medication, the number of alarms and alerts has gone up exponentially. This has resulted in what is known in the industry as alarm fatigue, and it can have deadly consequences.

Any visitor to a hospital can attest to the nearly nonstop barrage of beeps, buzzes and overhead pages. Most of these alarms are not critical — an oxygen sensor may have detached from a patient's finger, or a wire came unplugged. According to data from The Joint Commission, as many as 85 to 99 percent of those alarms do not actually require staff members to take any action. Clinicians begin to "tune out" those alarms

over time, and if a particular piece of equipment generates a high number of unnecessary alarms, nursing staff have even been known to turn down or turn off those alarms. That can result in fatalities. According to the FDA, there were more than 200 deaths linked to alarm monitoring between 2005 and 2010.

In some hospitals, alarms have been integrated with existing pager systems, but these solutions don't provide enough alarm data for nurses to accurately gauge the severity of the alert, and may notify multiple nurses, who then have no way of knowing who else may be responding to the call.

Telemetry nurses are generally tasked with monitoring these alarms, viewing patient data on screens at the nursing station and functioning as virtual air traffic controllers when it comes to dispatching staff to respond in person. Nurses spend time walking back and forth to the nursing station between visits to patient beds to assess patient status.

New mobile solutions are emerging that will help hospitals optimize their efforts to improve communications. Care teams are replacing old VOIP phone systems with smartphones. EMR systems

Meds admin with converged device (iPhone)

now feature support for mobile devices based on Windows, Android, and iOS platforms, and some even support two-way voice queries via smartphones. Medical devices are being integrated into hospital data networks. Providers want to consolidate these capabilities to produce tangible benefits for both staff and patients, and in a way that is more cost-effective and efficient than their legacy solutions.

What is needed is a fully integrated, converged mobile device that can allow nursing staff to access EMR information, respond to alarms and alerts, communicate with patients while on the move, scan bar coded patient wristbands and medications, and share information with other caregivers in real time.

The Converged Mobile Device

Legacy solutions have left nurses and other caregivers saddled with an array of proprietary devices including pagers, VOIP phones, bar code scanners, voice pendants, and other hardware. Migrating to a converged mobile device can lighten the load for the nursing staff, both literally and figuratively. By doing so, hospitals can reduce the complexity of the nursing IT tool belt and prevent medical errors caused by alarm and alert fatigue.

By consolidating functions on one device and providing quick access to medical records, drug information, and instant communication with physicians and co-workers, these solutions also empower nurses to make better, faster decisions. Mobility allows nurses to respond promptly to alerts and patient

requests, armed with real-time chart data and medical equipment readings. They can also query physicians and other nurses much faster than they could using overhead paging and voice calls, which helps them to provide better care. These converged devices can also reduce technology complexity and costs for already over-taxed hospital IT departments that currently have to support multiple devices and systems.

For the healthcare environment, a converged mobile device is not just a consumer-grade, off-the-shelf smartphone. While these applications do run on the familiar Android, iOS and Windows mobile platforms, they must include a hospital-grade bar code scanner; provide extended battery life sufficient to last an entire shift on a single charge; be rugged enough to be dropped to concrete without shattering the display; and be able to withstand regular cleaning with caustic, hospital-grade disinfectant cleansers.

Operationally, these devices must be able to run a

Positive patient ID with converged device (iPhone)

variety of healthcare applications and support multiple messaging platforms so that healthcare organizations can glean the full benefits of mobility. Optimally, users of a converged mobile device in a hospital setting should be able to:

- Receive a phone call from a doctor/clinician

- Send a secure text message to another clinician

- Scan a bar code on a patient wristband, blood bag, medication, or medical chart

- Enter patient data directly into the electronic medical record (EMR) system

- Look up a drug using a pharmaceutical application such as Eprocrates

- Receive and respond to alarms and alerts from medical equipment and patient rooms

- Talk directly to a patient who has pressed the nurse call button

These devices act as an adjunct or complement to existing workstation on wheels (WOWs) solutions, which would be used for heavier documentation activities that require a full keyboard. The combination of converged mobile devices, WOWs, and desktop systems can provide nurses and physicians with multiple entry points to the electronic medical record, offering the flexibility to use whichever device is most appropriate to the environment or situation.

Mobile workflows are faster

There are two basic approaches to adopting true converged mobile computing in a healthcare setting, and which approach a hospital selects will depend largely on their choice of mobile operating system platform.

For organizations that have deployed or are planning to deploy Apple
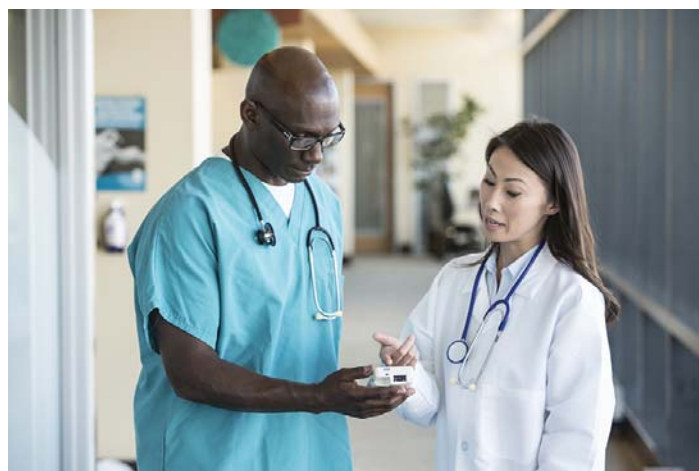

Tablets and smartphones for EMR access

iPhones, there are protective sleds available that can provide ruggedization, enhanced bar code scanning, improved battery life, and other capabilities. These sleds enable consumer-grade iPhones to function like enterprise-grade mobile computers and bar code scanners. Typically, they provide additional battery power and drop protection, as well as the ability to resist strong hospital disinfectants.

By using the iPhone platform, users still have access to the familiar touch screen user interface as well as communication and telephony tools, e-mail access, and standard apps. Using the protective sleds allows these hospitals to also gain the benefits of more reliable and faster bar code scanning, along with increased durability.

For organizations with a Windows or Android-based environment, there are purpose-built, rugged nursing smartphones and other mobile devices available that provide robust integrated bar code scanners, wireless connectivity (both cellular and WiFi), and multi-application support for enterprise-grade healthcare solutions.

These purpose-built devices tend to be more expensive than off-the-shelf consumer phones, but are intrinsically more durable, offering extended battery life, high-grade scanning functionality, longer service and maintenance contracts, and longer device life.

The decision on which approach to take typically depends on which mobile device operating system the hospital has chosen to support, their device upgrade/ refresh strategy, security requirements, remote
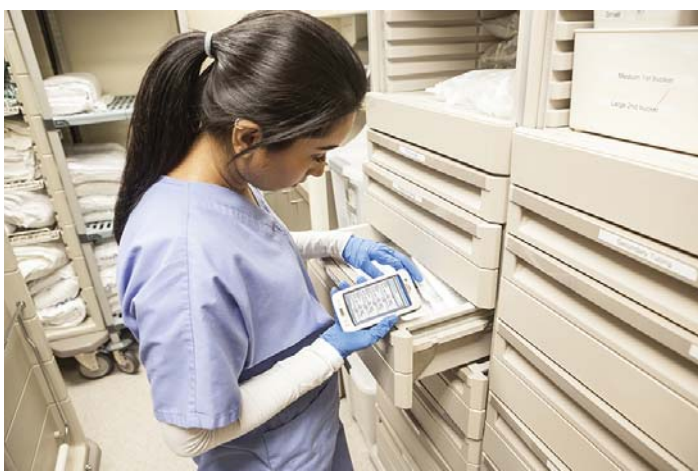
Converged device used in supplies management

management requirements, and their choice of mobile device management solution.

Better Care, Lower Costs

Regardless of whether the facility deploys a purpose-built device or iPhones equipped with scanning sleds, the benefits of deploying one mobile device that allows the nursing staff to interact with doctors, patients, other nurses, and a full suite of patient care and messaging applications can improve both patient care and staff efficiency, while simultaneously improving the overall work environment.

An emerging class of alarm management solutions that help filter the data arriving from connected medical devices in patient rooms, when combined with these converged mobile devices, can help nurses better prioritize and respond to room-level alarms and alerts. These solutions provide more detailed information directly to the nurse's smartphone, allowing them to determine which alerts require immediate attention with a quick glance at their mobile devices.

They also have the flexibility of responding to the alert with an in-person visit, a text message, or a voice call. Many legacy VOIP phone and pager solutions did not support text messaging. With a converged device, if a patient presses the nurse call button, a nurse can call that patient directly from another part of the hospital, find out what they need, and even dispatch another staff member to handle the request via text.

By empowering the nursing staff with these mobile devices, hospitals can reduce alarm fatigue, improve patient safety and quality of care, reduce the noise created by audible alarms and overhead paging, and ensure caregivers have access to all of the information they need to complete their duties without walking back and forth to the nurses' station. By routing nurse call requests through the smartphones, hospitals can even monitor the level of responsiveness and adjust staff scheduling accordingly.

Workflows can also be automated using converged devices. Notifications can be quickly sent to nurses, physicians and other team members when patients are ready to transition from one stage of care to another, and staff collaboration can be enhanced.

By putting multiple methods of communication in the hands of clinicians and nurses on a single device, staff can securely communicate and securely send information to each other no matter where they are in the facility. Using the messaging capabilities on the phone, staff can send and respond to queries in less time than is typically required when they rely on voice calls or physically locating the other staffers.

Consider that in many hospitals, simply asking a question of another staff member and receiving an answer may require a combination of walking the floor to search for a colleague, calls and call-backs, and overhead paging. According to a study by the Wood Johnson Foundation[1], nurses waste as much as 60 minutes of each day tracking

Using a converged device to scan patient wristbands

[1]Technology at Cedars-Sinai Hospital | RWJF Initiative on the Future of Nursing. (n.d.). Technology at Cedars-Sinai Hospital | RWJF Initiative on the Future of Nursing. Retrieved July 31, 2014, from http://thefutureofnursing.org/resource/detail/technology-cedars-sinai-hospital

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down physicians for a response. These delays can be virtually eliminated with smart mobile devices.

All of these factors combine to improve patient satisfaction scores. The improvements to staff efficiency and patient safety and care enabled by this type of mobile computing solution can have a direct impact on the likelihood of physician referrals.

Using converged devices also creates a less expensive deployment model that involves purchasing and supporting fewer devices. Instead of requiring IT staffers to maintain expertise and support capabilities for VOIP solutions, mobile computers, bar codes scanners, and other hardware and their accompanying applications, the IT department can shift to a more software/app-centric model, centrally managing a uniform fleet of mobile devices that run a variety of clinical applications in any combination appropriate for the individual user. From a cost perspective, that eliminates the expense of maintaining licensing for proprietary solutions.

Conclusion

The use of mobile technology in the healthcare industry is already widespread, but as new government mandates around outcomes, patient safety, and data security take effect, and changes in the health insurance market put more price pressure on providers, the multitude of legacy point solutions in place at most hospitals has become unsustainably inefficient and costly to support.

Converged mobile devices that leverage modern smartphone platforms and can run a variety of emerging healthcare applications can eliminate this inefficiency. Consolidating the mobile functions already in place at most hospitals — the nurse call systems, drug/patient bar code scanning solutions, VOIP phones, pagers — onto one device with a familiar user interface can make nurses more productive and responsive, improve patient care and safety, and reduce IT support costs.

About Honeywell Scanning & Mobility

Honeywell Scanning & Mobility is a leading manufacturer of high-performance image-and laser- based data collection hardware, including rugged mobile computers and bar code scanners. Our product portfolio is one of the broadest in the AIDC industry, providing you with solutions for vertical markets such as retail; healthcare; and transportation and logistics. We complement our innovative products with advanced software, service and professional solutions that enable customers to effectively manage data and assets. Honeywell products are sold worldwide through a network of distributor and reseller partners. www.honeywellaidc.com

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