SAMSUNG

White Paper:

The Mobile-First Hospital: A Guide to Consolidating Clinical Communications on Smartphones

Introduction: The Mobile-First Hospital

Imagine your ER team is alerted to two critically injured patients enroute from a car crash. Nurses lose precious minutes identifying the surgeons on duty and leaving messages with answering service. The surgeon also wastes time retrieving the message. Once the patients arrive, the team evaluates them, treats them, orders tests and reaches out to specialists. Again time is wasted logging in to computers, communicating with the lab, and waiting for test results. In a worst case, a patient's condition worsens due to delayed interventions. All the while, documentation of decisions and actions is unreliable due to the lack of effective communications tools.

Legacy communications systems are not the only problem in the ER; they hinder performance in day-to-day clinical operations. Nurses lose time every day tracking down physicians and managing communications via pagers, fax machines and desktop computers. Inefficient communications systems cause "death by a thousand paper cuts" to nurses and allied professionals, as they lose a minute here and a minute there while trying to help patients.

Medical technology has advanced rapidly over the past few decades, but clinical communications technology in many healthcare organizations has yet to catch up. Physicians, nurses and allied health professionals experience unnecessary stress, because they know there's a better way to share information, coordinate teams and access data. In their personal lives, they can do all that using one device: a smartphone. At work, however, they see their time squandered and their attention diverted by antiquated, inefficient communications technology.

Not only does this cause frustrating workflow inefficiencies for hospital staff, but it leads to communications gaps that affect patient satisfaction, care and safety — all quality measures that determine a hospital's reputation and impact Medicare reimbursements. The Joint Commission, which sets industry standards for healthcare organizations and provides accreditation for hospitals, has repeatedly included "improved clinical communications" on its annual list of National Patient Safety Goals. In 2017, it was number two on the list, specifically calling out the need for clinicians to access "critical results of tests and diagnostic procedures on a timely basis."[1]

To address these and other challenges, forward-thinking healthcare leaders are providing employees with hospital-owned smartphones and clinical communications platforms that include a wide spectrum of communication features — voice, secure texting, videoconferencing — as well as deep integration with electronic health records (EHR), nurse call systems, bedside telemetry machines and other key hospital systems. Given the universal struggle to retain and support skilled staff, hospitals have a great opportunity to improve overall performance by modernizing their clinical communications infrastructure.

> This whitepaper will discuss the business case for smartphone-based clinical communications, how these next-gen solutions meet hospital's unique needs and what it takes to get started.

The High Cost of Communication Gaps

Workflow inefficiencies caused by inadequate clinical communications cost U.S. hospitals about **$1.75 million per year per hospital**.[2]

Communications failures are a primary factor in **30 percent of malpractice claims** in U.S. hospitals and medical practices, resulting in 1,744 deaths and $1.7 billion in costs over five years.[3]

Communication failures contribute to somewhere between **50 to 80 percent of sentinel events** — meaning a patient dies or is seriously harmed by a medical error.[4]

Part 1: What a Difference a Smartphone Makes

Digital transformation has already begun in healthcare. Most hospitals are now up to speed with EHRs. They have invested in smarter bedside telemetry, biomedical equipment and patient monitoring technology to provide actionable, real-time data. The challenge that remains is getting that data to the right team members as quickly and easily as possible.

This is no small task in a hospital. Physicians and nurses are always on the move, and many people are involved in each patient's care, often across multiple shifts.

Without the benefit of an integrated mobile solution, medical staff have to devote too much attention to communications and accessing key hospital systems. They have to check duty lists to find out who is on duty, leave messages, wait for callbacks, and check multiple systems that might include pagers, desktop-based EHR, and fax machines. Worse yet, hospital staff might be so frustrated by the current communications and computing platforms, that they resort to using personal devices for hospital business. This kind of "shadow IT" creates risk of costly Health Insurance Portability and Accountability Act (HIPAA) violations.

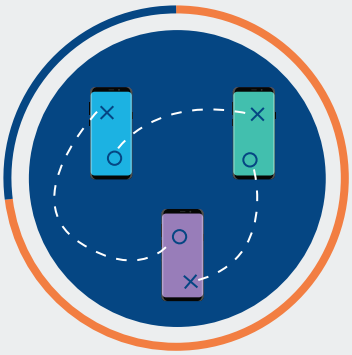
A smartphone deployment is the ideal choice for streamlining clinical communications, but the device alone is not the answer. Hospitals achieve success by selecting and deploying the right clinical communications applications and integrating them for synergistic improvements. For maximum ROI, hospitals also need to consolidate their device fleets. Leading mobile-based clinical communications platforms provide all the communications options that care teams want, and can be integrated with other hospital technology to streamline workflows, automate data entry and connect care teams across multiple shifts and locations.

Inefficient Communications Add Stress for Nurses

Clinical communications is a critical issue for nurses, which makes it a critical issue for hospitals. Many hospitals are already struggling with nursing shortages, and the U.S. Department of Health and Human Services projects shortages of more than 10,000 RNs in four U.S. states by 2030.[5] Many hospitals are forced to recruit nurses abroad to maintain adequate staffing. By saddling nurses with inadequate communications tools, hospitals increase on-the-job stress and increase turnover.

Mobilizing Clinical Communications

90 percent
of hospitals are making significant investments in smartphones and secure mobile communications platforms



73 percent
have developed or are developing mobile strategies for clinical communications

68 percent
percent are using middleware to collect, monitor and manage data, alerts and alarms generated from hospital legacy systems[4]

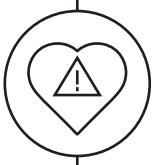
Six Benefits of Mobile Clinical Communications

A well-designed mobile solution can boost clinician productivity and satisfaction, improve the patient experience and help hospitals ensure compliance while saving money.

1. Improved Collaboration

Rather than being tethered to multiple mobile devices, clinicians only need one hospital-owned and/or hospital-secured smartphone to connect with other care team members, using whatever channel is most appropriate for the situation.

The most advanced clinical communications platforms map roles to schedules so that staff can get messages to the right person — without even knowing who's currently on duty. For instance, a nurse who needs to reach the on-call neurologist in the middle of the night doesn't have to find out who's on duty and page a different doctor. Instead, she can text her message to the role, and it will be routed to the right person. That means fewer calls to the wrong team member, less time spent playing phone tag and more time spent taking care of patients. Efficient, effective communications can be a great source of relief for nurses and other staff who regularly struggle with frustration and burnout.



2. Greater Productivity Through EHR Access and Alerts

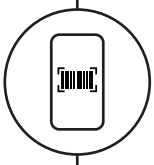
By providing clinicians with secure mobile EHR access, smartphones enable them to share information in real-time and save time on charting later. Leading unified clinical communications platforms make EHR even more valuable by enabling real-time alerts — for instance, when lab results are ready to be viewed.

Real-time EHR alerts enable care teams to act on information quickly if lab results show something troubling, and to discharge well patients more quickly. A University of Toronto study found that patients admitted into emergency rooms with chest pain were discharged 26 minutes earlier if their physician received a lab results notification on a smartphone.[6] That faster discharge means a more positive experience for the patient with chest pains, as well as for the next patient in the waiting room.

3. Prevent Alarm Fatigue

The Joint Commission estimates that in a single day, tens of thousands of alarms signal throughout the average hospital.[7] Roughly 85 to 99 percent of those alarms don't require medical intervention, but some need immediate attention. However, the sheer volume of alarms can desensitize hospital staff and lead to life-threatening delays in care. They can also frustrate patients, who need a quiet place to rest and heal.

Modern clinical communications technology can be integrated with bedside equipment and nurse call systems to filter out false alarms, prioritize patient requests, minimize the number of alarms that nurses need to respond to and send notifications about important alarms directly to their smartphones.



4. Reduce Medical Errors

Medical errors are the third leading cause of death in the U.S., contributing to 250,000 fatalities each year, according to Johns Hopkins.[8]

Smartphones with integrated barcode scanners can support positive ID applications such as bar coding medication administration. These solutions alert clinicians when they're about to give a patient the wrong medications or medications that aren't yet due.

5. Reduce Cost of Clinical Communications

Providing staff with hospital-owned smartphones does require an upfront cost, but employers don't have to worry about costly HIPAA violations or using IT resources to manage a fleet of employee-owned devices. Communications improvements also help to boost patient satisfaction scores and reduce readmissions, both of which impact hospitals' bottom lines.

Smartphone-based clinical communications solutions often cost less than legacy technology. A study conducted by HIMSS Analytics found that 90 percent of hospitals still use pagers, for which they pay an average $180,000 per year — roughly 45 percent more than they would pay for smartphone-based unified communications solutions.[9]

6. Provide Better Documentation

A modern, text-based communications infrastructure provides a reliable audit trail that is missing from most legacy solutions. Clinicians are able to record every action they take, giving the hospital the ability to document its treatments. In the event of a lawsuit, the organization is much better prepared to defend the actions of its medical professionals.

For hospital executives and IT leaders, providing mobile communications solutions is no longer just about keeping staff happy. It's a business imperative.

Part 2: Meeting Unique Hospital Needs

Compared to other industries, healthcare is behind the curve with mobile transformation. It's not that healthcare leaders fail to recognize the value of these technologies. It's that hospitals and healthcare systems operate in a highly regulated environment that has been overwhelmed with other technology priorities, such as EHR implementation and investing in state-of-the-art medical equipment.

Without standardized communication technology and processes, most hospitals have taken a Bring Your Own Device (BYOD) approach to mobile. Often this is decision is driven by budgetary limitations and the belief that allowing clinicians to use their own devices will save the organization money. However, in reality, adopting a BYOD approach slows adoption of mobile initiatives and costs the hospital more in terms of device management, compatibility issues and troubleshooting. BYOD prevents hospitals from configuring and controlling apps and devices and exposes patient information to the risk of data theft. Too many different devices and operating systems, and the use of disparate applications make it impossible for IT to truly optimize communications and workflows, so mobile devices aren't as valuable as they could be for clinicians or hospitals.

By issuing smartphones and investing in unified communications solutions, hospitals can provide a customized mobile solution that meets the unique needs of clinicians and health systems.

Key Hospital Requirements:

Ease of Use

Doctors and nurses are busy people — they've lost a lot of productivity in recent years as they've adapted to new EHR systems and other hospital technology. They don't have time to waste on further technological complications. Thankfully, most people already know how to use a smartphone.

In a recent study by the University of Iowa, 85 percent of clinicians said smartphones were "easy to use for routine clinical communications," 75 percent found medical applications installed on smartphones helpful and more than half said pretraining wasn't necessary for using these tools.[10]

Effective Communication and Efficient Workflows

A smartphone isn't just one more device for clinicians to carry around. With the right integrations, it's the only device they need to collaborate with coworkers, communicate with patients and receive real-time insights to improve patient care.

A robust mobile clinical communications platform can be integrated with:

- EHR
- Nurse call systems
- Bedside telemetry
- Scheduling apps or spreadsheets
- Hospital phone system
- Legacy paging systems
- Answering service and call center technology

With this functionality, clinicians can communicate with each other and with the technology they need to do their jobs.

Security and Compliance

Data security is important for any company, but the stakes are particularly high for healthcare providers, whose data management practices must meet HIPAA requirements.

When physicians and allied health professionals use their personal phones for clinical communications, they're more likely to violate HIPAA regulations by sharing patient information via an unsecured channel or network. Lost, stolen or hacked personal devices can also lead to costly data breaches.

In 2018, 365 healthcare data breaches were reported, up almost 2 percent from 2017 and 83 percent from 2010.[11] Those data breaches cost hospitals roughly $380 per record, on average, according to the Ponemon Institute.[12] That's more than 2.5 times the global average across industries. This is why leading hospitals and medical practices are empowering their teams with secure devices, providing communications solutions that deliver the benefits of mobile without the additional risks.

Manageability

The more devices and communications solutions that are in use in a hospital, the more strained IT resources become and the less secure communications become. For IT to manage mobile clinical solutions efficiently and effectively, they need platform consolidation, developer-friendly integrations and device configuration and management capabilities. That means standardizing devices and having as much control as possible over those devices.

Another key way to lighten the load for IT, while also providing more seamless clinical communications, is to invest in unified communications solutions that include voice, texting, videoconferencing and developer-friendly integrations for legacy technology. Otherwise, IT will need to deal with multiple vendors and manage multiple software platforms, all of which are on different update schedules.

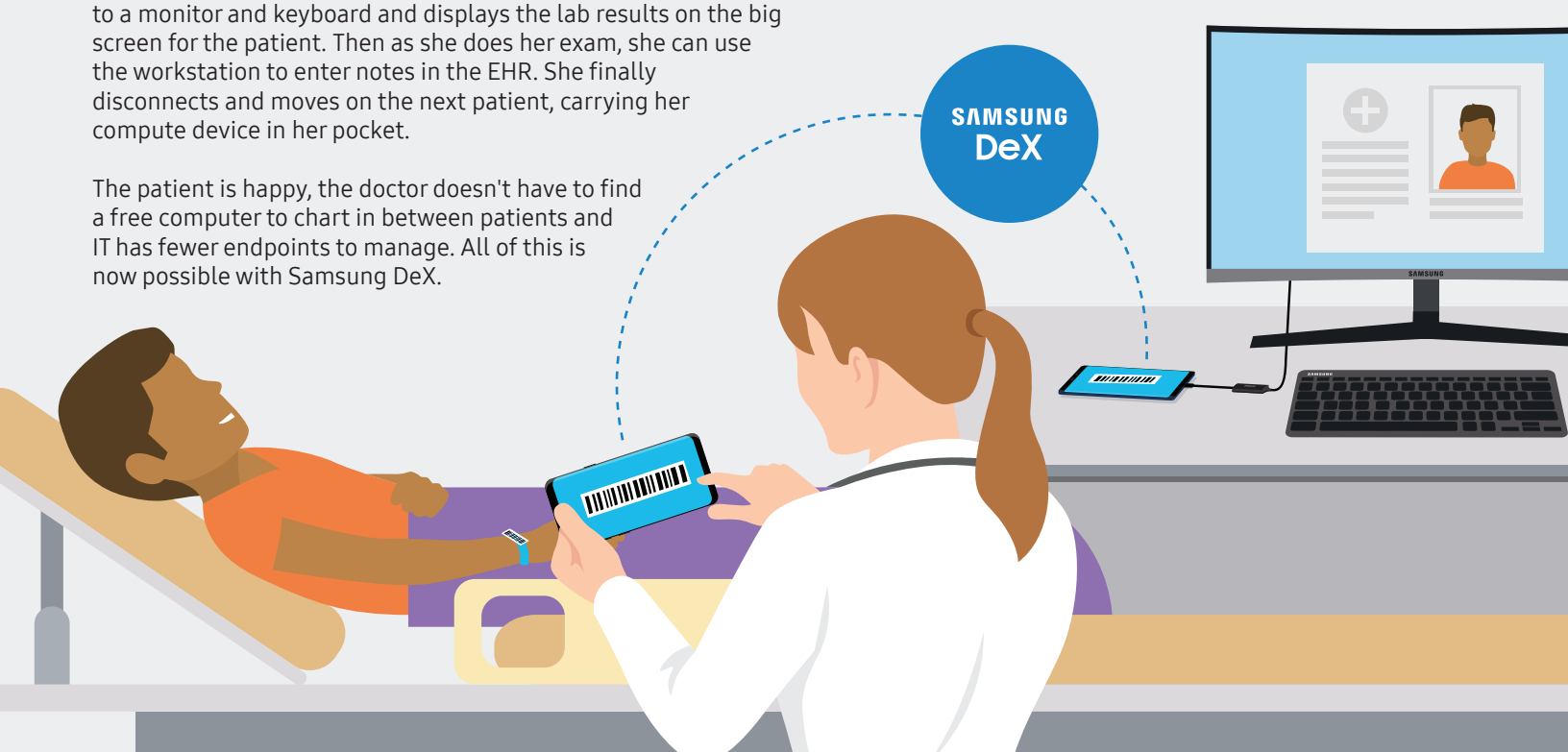
The best way to keep IT efficient, clinicians productive and patient data safe is to invest in a single-device platform and a single communications platform that meets all of a hospital's unique needs.

Replace Desktop PCs With Samsung DeX

The latest generation of smartphones can approximate the computing power of laptop and desktop computers, but the smaller screen size and onscreen keyboard have inherent limitations. In clinical environments, there are many instances when a larger screen and a full keyboard are preferred. Samsung DeX lets clinicians connect compatible Galaxy devices to a monitor, keyboard and mouse to provide a desktop computing experience, eliminating the need for a laptop or desktop computer. Instead of installing stationary computers, hospitals can install keyboard-mouse-monitor setups in patient rooms and at nurses stations. Clinicians can easily dock their phones via HDMI and transition to a rich desktop experience that leverages mobile applications or a virtual desktop infrastructure (VDI). They can access apps in desktop views, use keyboard shortcuts and drag and drop files with a mouse.

Picture this: A physician walks into a hospital room and uses her phone to scan the barcode on the patient's wristband, which automatically pulls up the patient's electronic records, including new lab results she wants the patient to see. She docks the phone to a monitor and keyboard and displays the lab results on the big screen for the patient. Then as she does her exam, she can use the workstation to enter notes in the EHR. She finally disconnects and moves on the next patient, carrying her compute device in her pocket.

The patient is happy, the doctor doesn't have to find a free computer to chart in between patients and IT has fewer endpoints to manage. All of this is now possible with Samsung DeX.



Part 3: A Mobile Tranformation Roadmap

The mobile revolution may be underway in healthcare, but so far, many organizations have only taken baby steps. Forward-thinking hospitals can lead the charge down the path to mobile-only clinical communications.

What does it take to get there?

Step 1

Commit to Hospital-Owned Devices

The more control that IT has over clinician smartphones, the more secure they can make them. Just as importantly, IT can customize the phones to improve the user experience, prevent data breaches and boost the device's overall performance. By consolidating on the Android platform, hospitals also reduce the device count and streamline management.

When considering smartphone purchases, hospitals often buy them for nurses and allied professionals, while letting physicians continue on a BYOD policy. However, physicians aren't to be overlooked. To truly optimize clinical communications, all members of the care team need to have the right devices, with the right apps, integrated with the right services and protected by hospital IT.

That said, some physicians might be unwilling to use corporate-issued devices or expect a more high-end device than other hospital employees. So any successful mobile plan should be flexible enough to incorporate and secure physician-owned devices.

Step 2

Take Inventory of Clinical Requirements

For smartphone solutions to solve communication challenges and improve clinical workflows, hospital leaders must have a deep understanding of them. The best place to start is simply talking to care team members about their needs and problems, or better yet, forming an interdisciplinary mobile innovation committee comprised of doctors, nurses and other allied health professionals.

Together, they can help administrators and IT leaders understand how to best map current workflows to communications solutions and identify opportunities to close communication loops, expedite collaboration and streamline workflows.

Step 3

Plan to Integrate Apps and Legacy Technology

For IT to customize and optimize devices, they need to know exactly which apps clinicians need to access. Along with communications apps, this list might include EHR, medical dictionaries, pharmacology guides, patient education apps, quick links to hospital procedures and safety protocols, along with any other information that clinicians want to have available with a single tap.

IT also needs to know which legacy technology clinicians need alerts from (e.g., nurse call, bedside telemetry) so they can incorporate middleware that collects, analyzes and disseminates this data.

Customize the Clinician Experience With Knox Configure

Manually configuring smartphones for a hospital's entire clinical staff is a time-consuming process for IT administrators. Just going through the initial setup wizard typically takes 11 to 13 taps on the screen. Then they must install mobile device management clients, adjust settings, and add or remove apps, and set parameters that might compromise data security. Doing this for hundreds of devices could take days or even weeks, and if devices ever need a factory reset, IT must go through this process all over again.

That's where Samsung Knox Configure comes in. Using Samsung's suite of customization APIs, hospitals can configure staff smartphones to provide a customized user experience with only the apps that they need. Unnecessary functionality and settings get locked down, icons always deploy to the same spot and app configurations remain on the device, even after a factory reset. The smartphone essentially becomes a fully customized device that's clutter-free and highly secure.

Once the hospital has created a Knox Configure profile, they can push it to an entire fleet of clinician smartphones. The moment the clinician powers their phone on for the first time, it will download the Knox profile, including all the apps and settings, so the clinician can start making their rounds right away. When configurations are uniform, devices become interchangeable and any professional can pick up a device they have never used before and achieve full functionality just by logging in.

Step 4

Prepare Infrastructures

Along with clinical requirements, hospitals must consider IT requirements, specifically network coverage. If clinicians are only communicating via smartphones, those smartphones need to work everywhere in the hospital and need enough shared bandwidth for everyone's device to run efficiently.

In an effort to better support Wi-Fi-enabled bedside telemetry units and monitoring equipment, most major hospitals have already addressed WI-Fi issues such as dead zones and capacity shortages. As hospitals switch more of their mission critical communications to smartphones, success depends on having more than enough capacity everywhere with no dark areas.

Hospitals also face a decision over locked vs. unlocked phones. Consider purchasing unlocked phones without cellular connectivity if the devices are only to be used within the hospital. This will reduce the opex costs of the mobile initiative. For clinical staff who need to be reachable when remote or after hours, providing a device with a 4G plan makes sense.

Step 5

Prepare to Manage Devices and Applications

All devices that access or transmit patient information need to be secured and managed by the hospital, regardless of whether the hospital owns the device. IT also needs the ability to remotely wipe lost or stolen devices, or devices owned by clinicians who no longer work for the hospital.

Mobile device management (MDM) and enterprise mobile management (EMM) solutions provide the capability to manage phones remotely, keep operating systems and applications up to date, whitelist and blocklist applications, and remotely wipe any device.

Step 6

Choose Management Systems and Tools

Once hospitals have a plan for moving forward with mobile, the final step before implementation is finding the right partners for the journey. That includes smartphone manufacturers, software vendors and unified clinical communications providers.

The best solutions for hospitals are those with rich industry experience and expertise, robust solutions that can be integrated with other technology and cloud-based platforms that can be easily and automatically updated and upgraded for optimal performance, minimal downtime, and enhanced security.

With the right technology and partners to help them navigate their way through implementation, healthcare organizations will be well on their way to mobile-only clinical communications that improve clinician productivity, patient experiences and hospitals' bottom lines.

How Samsung Knox Secures Smartphones

Samsung Galaxy smartphones are secured by Samsung Knox, a defense-grade mobile security platform comprising hardware- and software-based protection from the chip up. Every device uses a "root of trust," which is a series of stringent checks and balances that begin at the hardware level. The root of trust makes devices difficult to attack by detecting whether the operating system is compromised and whether certificates are stored securely.

In addition, Samsung offers Knox Manage, a cloud-based EMM solution that enables IT to apply a variety of controls and protections across a fleet of mobile devices.

This includes the ability to:

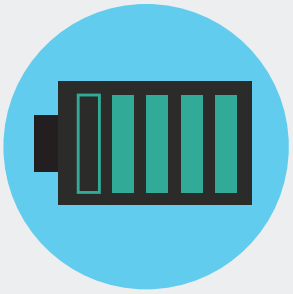
- a Partition and containerize company apps and data from personal ones
- b Disallow hospital app access over unsecure Wi-Fi connections
- c Require biometric or multifactor authentication to access hospital apps
- d Track devices via GPS
- e Lock or wipe devices remotely
- f Provide remote IT support

Device Selection Checklist

What factors are most important when choosing a smartphone for clinicians?

Durability:

The device should be able to sustain short drops to a hard cement floor and exposure to fluids and harsh chemicals, or should have a ruggedized case to protect it.



Battery life:

The device needs to last an entire 12 to 13-hour shift, even with apps running in the background.

Cleanability:

The device needs to be easily cleaned and sterilized to prevent spreading infection.

Vibrating alerts:

Clinicians should be able to receive alerts without waking sleeping patients.

Voice-to-text capabilities:

The most useful devices in a healthcare environment can convert spoken words to text.

Built-in scanner:

The device needs a camera capable of barcode scanning to support positive patient identification apps.

Glove mode:

Nurses and other allied health professionals need a device they can operate while their hands are gloved.

Stylus:

A stylus can improve functionality by simplifying note-taking and enabling signature collection.

Conclusion: The Future Is Mobile

The future of clinical communications is mobile. Clinicians know it. Patients know it. The only question is, how long will it take hospitals to get there?

Leading hospitals have already begun the journey, but most still have miles to go. For healthcare leaders that are willing to invest in hospital-owned devices and unified clinical communications solutions, the journey is well worth the effort.

Mobile provides the best path forward for hospitals. Commit to it, invest in it, strategize for it and streamline clinical communications.

Learn more about Samsung's mobile solutions for healthcare

Footnotes

1 "Supply and Demand Projections of the Nursing Workforce: 2014-2030
," U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, July 2017.
<https://bhw.hrsa.gov/sites/default/files/bhw/nchwa/projections/NCHWA_HRSA_Nursing_Report.pdf/>

2 "2017 National Patient Safety Goals," The Joint Commission, November 2016. <https://www.jointcommission.org/npsg_presentation/>

3 "The Imprivata Report on the Economic Impact of Inefficient Communications in Healthcare," Ponemon Institute, June 2014.

4 "Malpractice Risks in Communication Failures," CRICO and Harvard, 2015.
<https://www.rmf.harvard.edu/Malpractice-Data/Annual-Benchmark-Reports/Risks-in-Communication-Failures>

5 "Patient Handoffs: The Gap Where Mistakes Are Made," Patient Safety Monitor Journal, November 2017.
<https://www.psqh.com/analysis/patient-handoffs-gap-mistakes-made/#>

6 Juliet Van Wagenen, "Rising Use of Smartphones in Hospitals Streamlines Patient Care," HealthTech Magazine, July 2017.
<https://healthtechmagazine.net/article/2017/07/smartphones-begin-permeate-all-aspects-healthcare>

7 "Medical Device Alarm Safety," The Joint Commission, accessed January 2019. <https://www.jointcommission.org/assets/1/6/medical_device_alarm_safety_infographic.pdf>

8 "Study Suggests Medical Errors Now Third Leading Cause of Death in the U.S.," Johns Hopkins Medicine, May 3, 2016.
<https://www.hopkinsmedicine.org/news/media/releases/study_suggests_medical_errors_now_third_leading_cause_of_death_in_the_us>

9 "Groundbreaking Research Reveals Hidden Costs Of Pager Usage In U.S. Hospitals," TigerConnect and HIMSS Analytics, February 2016.
<https://www.prnewswire.com/news-releases/groundbreaking-research-reveals-hidden-costs-of-pager-usage-in-us-hospitals-300226203.html>

10 Hamed P. Salehi, "What clinicians think about smartphones for healthcare communication," September 2018. <http://www.sciedu.ca/journal/index.php/jha/article/view/13575/8738>

11 "Analysis of 2018 Healthcare Data Breaches," HIPAA Journal, January 2019. . <https://www.hipaajournal.com/analysis-of-healthcare-data-breaches/>

12 Elizabeth Snell, "Healthcare Data Breach Costs Highest for 7th Straight Year," June 2017. <https://healthitsecurity.com/news/healthcare-data-breach-costs-highest-for-7th-straight-year>