Deploying iPhone for Clinical Communication and Nursing Care

Content

Overview

Within healthcare institutions, nurses need to be able to communicate quickly and efficiently with patients, families, doctors, and other care teams. They need to perform a range of tasks to support their patients, such as coordinating care, responding to alerts and alarms, ensuring compliance with medication administration, documenting patient observations, and completing care interventions. Deploying iPhone or iPad with third-party iOS or iPadOS apps can make it easier for nurses to accomplish these tasks, which helps them deliver the best care possible for their patients. Nurses can also use third-party apps to access clinical reference materials, deliver virtual care, complete education, and fulfill continuing education (CME/CE) requirements right from iPhone.

This document is intended to help hospital leadership teams understand the benefits of using iPhone and iPad with third-party apps to support nursing care, along with technical deployment considerations.

Benefits

Using iPhone as a multipurpose device

Care teams are dedicated to delivering the best possible patient care. But interruptions in daily workflows can often prevent nurses from focusing directly on patient care. Carrying several single-purpose devices — such as pagers or VoIP phones that deliver voice-only functionality — or rolling in a workstation on wheels for medication barcode scanning can make it challenging to manage daily tasks.

With healthcare apps on iPhone, Apple Watch, and iPad, nurses can accomplish much more than they can with a single-purpose device, including tasks like:

- **Secure communication.** Third-party messaging apps on iPhone combine secure messaging, voice calls, and video calls to help facilitate patient and care team communication — both inside the hospital and remotely — while maintaining confidentiality. These apps can integrate with the staff directory and schedules, so clinicians are able to search for members of the care team by role, staff assignment, and current rounding location. Messaging apps can include contextual information from patient records as well.

- **Alert and alarm management.** With apps on iPhone and Apple Watch, nurses can receive instant alerts and alarms from patient monitoring systems. Alerts and alarms can be customized for the care unit and tailored to hospital initiatives and safety protocols. Approved third-party apps can override volume or mute settings with a critical alerts entitlement. This allows clinicians to get critical alerts even if their devices are set to silent mode or Do Not Disturb.

- **Medication administration.** To help ensure they're administering the right medication to the right patient at the right time, nurses can scan both the patient's wristband and the medication barcode with an app that uses the iPhone camera. If a dose is being administered for the first time, an app can prompt the nurse to provide patient education, which increases compliance.

- **Specimen collection.** While collecting specimens, clinicians can use iOS apps on iPhone to receive orders, scan barcodes, print specimen labels, and document that the collections have been completed.

- **Mobile documentation.** Using a mobile app to document vitals, input/output (I/O), and clinical observations at the bedside can be more efficient, reduce opportunities for errors, and give clinicians more time to interact with patients.

- **Wound documentation.** Using the iPhone camera and a secure third-party nursing app, clinicians can capture the progress of a wound, then document and send the images to the electronic medical record (EMR).

- **Estimation of blood loss in surgery and labor and delivery.** In the operating room, nurses can estimate blood loss in real time by using the Triton AI app on iPhone to scan surgical sponges with computer vision. Triton AI uses the TrueDepth camera in iPhone to capture images of the surgical sponges, and it uses Core ML models to analyze the hemoglobin on each one. The app then displays the total estimated blood loss, the estimated hemoglobin loss, and a record of all sponges scanned.

- **Bedside ultrasound imaging.** Nurses can now perform ultrasound imaging at the bedside using handheld ultrasound probes that connect to iPhone or iPad. For peripheral IV placement, these ultrasound solutions assist with difficult vascular access procedures by letting nurses visualize the needle. They can also help reduce unnecessary catheterization by allowing nurses to scan the bladder at the bedside so they don't need to find a cumbersome bladder scanner cart.

Leveraging iOS

iOS — the world's most advanced mobile operating system — powers every iPhone. It's the best platform for innovation because of its comprehensive security, integrated hardware and software, vast library of apps for healthcare, extensive set of services and capabilities for developers, simple yet scalable deployment, and complete device management options.

Today's successful healthcare institutions view their mobile platforms as mission critical. Choosing the right platform is an essential enterprise decision. When you invest in iPhone and iOS, you're not only choosing the best devices for the current deployment but also considering the potential for future innovation across multiple use cases.

iOS is packed with amazing healthcare features that offer institutions powerful ways for clinicians to stay connected to patients and care teams, provide useful information, keep data secure, and protect patient privacy.

- **Critical alerts entitlement.** When this feature is enabled, it authorizes an app to play critical sounds that ignore Do Not Disturb and the device's silent switch. Critical alerts require a special entitlement issued by Apple.

- **Local Push Connectivity entitlement.** Apps typically use Local Push Connectivity in a restricted network environment and Apple Push Notification services (APNs) in an unrestricted network. The Local Push Connectivity API allows developers to create push connectivity service that works on local Wi-Fi networks. This app extension is responsible for maintaining a network connection with the provider server and receiving the notifications. The Local Push Connectivity API requires a special entitlement issued by Apple.

- **Forced on-device dictation.** Apple has introduced a mobile device management (MDM) restriction for supervised devices that limits keyboard dictation to be on device only. This feature forces iPhone or iPad to process keyboard dictation locally. Healthcare organizations have the ability to restrict dictation with iOS 14.5 or later and iPadOS 14.5 or later.

- **Medical barcode symbologies.** iOS 15 expanded support for barcode symbologies, including those commonly used for barcode medication administration (BCMA). With iOS support for multiple barcodes at once and the strong low-light capabilities of iPhone, nurses can scan codes — even in dark scenarios — without activating a laser or disturbing patients as they rest. Medical barcoding scanning is available for all developers to integrate natively into their apps at no cost.*

*Check with your solution provider for availability.

Deployment Considerations

Successful deployments typically rely on strong executive sponsorship and a clear understanding of technology solution requirements. Once your organization is aligned on your mobile strategy, Apple can help you assemble a team of solution providers to assist you with your deployment models and setting up your infrastructure. This section highlights best practices and learnings from successful deployments.

Selecting a solution provider

Clinical communications and EMR apps can support key clinical tasks on iPhone and iPad and provide robust integration services.

Evaluate potential app solutions

A variety of solutions are designed to help with nursing tasks, such as secure communications, alert and alarm management, clinical documentation, and medication administration. Some examples of leading providers of app solutions for nurses are Alertive, Ascom, Careflow, Epic, IQ Messenger, Mobile Heartbeat, Nervecentre, TigerConnect, Voalte, and Vocera.

When evaluating a potential app solution, consider the following:

- What specific tasks and workflows does the app solution support?
- Does the voice solution integrate with your communications platform and network?
- If the solution provides alerts and alarms, how does it integrate with existing systems? How does the solution prioritize and present the notifications?
- Is the app intuitive and easy for new users to learn?
- What's the recommended deployment model?
- Does the app solution use platform technologies like CallKit, AppConfig, Push to Talk, critical alerts, or quality of service (QoS)?

Sign up for integration services

Many solution providers can supply your hospital with a wide range of integration services, including project management, clinical leads, and technical oversight. They can offer live support options such as clinical process redesign, device integration, education planning, app configuration, troubleshooting, and upgrade management.

Aligning key stakeholders

As you prepare to introduce iPhone as the core of your mobile nursing care strategy, it's critical to engage both clinical and IT leadership to develop a common vision for success. Many institutions find it helpful to assign a senior-level clinical sponsor, such as a nurse executive. This individual can keep your organization focused on user needs while helping with change management and buy-in from nursing staff.

Once a sponsor is in place, you'll want to assemble a team of nurses, nursing informatics leaders, physicians, and IT infrastructure staff dedicated to bringing mobility to your organization. The team should also include members who work in other services — for example, pharmacy, lab, radiology, and transport. Assigning a product champion to the project is highly recommended. It's important to have someone who thinks about every element of the user experience.

Choosing the right deployment model

Institution-owned devices are purchased by the organization from Apple or a participating Apple Authorized Reseller or carrier. If a device is provided to each user, this is referred to as an *assigned deployment*. Devices can also be shared and rotated among users, which is referred to as a *shared deployment*. Institutionally owned devices can be deployed using Automated Device Enrollment as described in the following "Shared deployment" section.

Shared deployment: In a shared-device model, each deployed iPhone is utilized by multiple users. This model often requires allocating iPhone devices to each shift — for example, the day shift and the night shift. If there aren't enough devices to support each shift, the organization must ensure that battery packs and charging stations are available. At the end of each shift, a nurse wipes down their iPhone and battery case to meet infection control standards.

At deployment, devices can use Automated Device Enrollment to automatically enroll them into MDM and receive the initial configuration and apps. Or each iPhone can be connected by USB, and an automated enrollment process can automatically erase it, apply configurations, and take the device to the Home Screen before it's assigned to the next nurse. This workflow enables a hands-free setup, so users don't need to be involved in the shift change. And now, with the Return to Service feature in iOS 17, this workflow can be repeated between shifts completely wirelessly.

Assigned deployment: In this deployment model, hospitals assign each nurse their own device. Nurses can be allowed to access apps only onsite at the hospital or allowed to access some apps remotely, depending on their role. These permissions are maintained through MDM.

An assigned deployment has many benefits for hospitals — including reducing total costs by eliminating the need for charging bays, cables, battery packs, and provisioning software. Early testing on iPhone 12 and later models indicates that the iPhone battery can last a 12-hour shift; each organization should do their own testing to see if the battery lasts however long an entire shift is at their institution. If it does, the device won't require a battery pack, which would increase its size and weight.

Clinicians can use built-in iPhone features like Face ID and Touch ID for biometric authentication, making it easier for them to sign in. Organizations can also force on-device dictation so that a clinician's dictation stays on the device.

Eliminating the process of checking out a device, signing in to it, signing out, and checking it back in makes shift changes more efficient — which can impact nurse and patient satisfaction.

Assigned devices present several other opportunities to provide nurses with a better user experience and improve productivity. Personalizing their devices enables nurses to get the most out of Apple's powerful set of accessibility features. Nurses can use Apple Wallet to store and present their IDs and their facility access credentials. Assigned devices reduce the burden on IT to evaluate an app's compatibility with the organization's various deployment and authentication tools.

When considering which deployment model is right for your organization, be sure to comprehensively evaluate your institution's size, infrastructure, needs, and objectives.

Using Apple programs and MDM

Setting up and deploying iPhone throughout your hospital environment has never been easier. With the following key programs from Apple and a third-party MDM solution, your organization can easily deploy iPhone and content at scale.

- **Mobile device management** allows you to configure and manage your devices. Through MDM, you can:

  - Wirelessly distribute and manage apps according to your enterprise security policies.

  - Manage and schedule iOS and iPadOS updates.

  - Allow for an efficient sign-in experience with extensions that support SSO workflows. Vendors that support this functionality include Jamf, Intune, and VMware.

  - Wirelessly initiate a fully automated erasure and reconfiguration of your device.

- **Apple Business Manager** and **Apple School Manager** are simple web-based portals that help IT administrators enroll devices for automatic setup with MDM, purchase apps and books, and distribute custom apps within your organization.

  - In iOS 17, Managed Apple IDs get access to additional iCloud services. iCloud Keychain enables passwordless authentication with passkeys. A new declarative configuration allows an MDM solution to deploy organizational passkeys, helping IT admins ensure that organizational passkeys can be used only on devices approved by the organization.

Managing Apple devices

Automate device enrollment

Apple Business Manager and Apple School Manager provide a fast, streamlined way to deploy hospital-owned iOS and iPadOS devices that were purchased directly from Apple or from participating Apple Authorized Resellers or carriers. These programs allow Automated Device Enrollment to enroll devices into your organization's MDM solution without needing IT to physically touch them. Automated Device Enrollment enables supervision — a higher level of management — and ensures that MDM enrollment is mandatory.

Devices that were purchased elsewhere can be manually enrolled in Apple Business Manager or Apple School Manager using Apple Configurator. Once a device is enrolled in one of the programs, the organization has a 30-day provisional period to remove it from enrollment, supervision, and MDM.

Managed Apple IDs provide controlled access to various Apple services and are owned by the organization. They can be created manually in Apple Business Manager and Apple School Manager or created automatically using federation with an identity provider. With iOS 17, Apple is introducing integration support with any identity provider that uses the open standard OpenID Connect for identity management.

Manage configurations

Once you've selected an MDM solution, you'll be able to create configurations specifically optimized for nursing that your MDM solution can install over the air. A configuration profile contains settings and restrictions that set up the device for clinicians to use. These settings will streamline the nursing experience and disable features or services that could store personal data.

Configure settings

Ensure that devices used for nursing care have a baseline of configurations to function properly in your environment. This can include automatically configuring settings like Wi-Fi, VPN, and email. You can also require that passcodes be set, enabling easy access to internal apps and websites.

Disable restrictions

The following examples are restrictions that IT will likely disable to secure the devices and clinical apps.

Device. Disallow manual profile installation, force on-device-only dictation, disallow restrictions configuration, disallow device name changing, disallow account modification, force Limit Ad Tracking, and disallow pairing with non–Apple Configurator hosts.

Data. Disallow documents from managed sources to unmanaged destinations, disallow copy and paste from managed sources to unmanaged destinations, and enforce AirDrop as an unmanaged destination.

Media. Disallow the use of Game Center, deselect force iTunes Store password entry, and restrict media content as needed.

Manage the Home Screen layout, Lost Mode, and other settings

You can manage how apps, folders, and web clips are arranged on a supervised device's Home Screen. You can also enable use of the device's camera while disabling the built-in Camera app so that hospital staff can scan a patient's QR code using a secure patient app or add the patient's photo to an EMR app.

To find a missing iPhone, make sure your MDM solution supports the features related to Lost Mode, such as a lost message, tracking the device's location, and reenabling Lost Mode after a reset or restore.

Note: Lost Mode allows an administrator to query the location of an organization-owned lost device even if the user has disabled location services.

Assign apps to devices

To ensure that nurses have the apps they need for communication, you can assign apps directly to their devices using your MDM solution without requiring an Apple ID. Apps are licensed in volume using Apple Business Manager or Apple School Manager. They're pushed directly to devices using MDM, and licenses can be redistributed to devices as your organization's needs change. Anyone who uses a device can access the apps on it. Apps can even be preconfigured with specific settings so that it's easier for nurses to start using them.

These programs and tools are covered in more detail in iOS and iPadOS Deployment Overview and Apple Platform Deployment.

Planning your network infrastructure

Every iPhone is equipped with cellular data capability but can operate exclusively with advanced Wi-Fi technologies, if hospitals choose. To avoid cellular data charges, iPhone automatically sends and receives data using Wi-Fi when a known Wi-Fi network is available. Having consistent and reliable Wi-Fi network connectivity in the hospital is essential for optimal iPhone functionality. In the hospital environment, sensitive healthcare data also demands a secure Wi-Fi deployment that uses WPA2 or WPA3 authentication protocol with certificate-based authentication.

Private cellular networks are a great way to provide network connectivity in areas where Wi-Fi might not be available or feasible. With iOS and iPadOS 17, compatible iPhone and iPad models support private LTE, 5G non-standalone, and 5G standalone cellular networks. There are management options to prefer cellular connectivity over Wi-Fi and assign a managed app to a specific 5G network slice provided by a supporting carrier. Network slicing in 5G standalone networks allows traffic to be treated with a specific QoS.

Nurses and other care team members are inherently mobile as they move from room to room. Ensuring that devices move seamlessly between access points on the same network while roaming is critical to delivering a good user experience, especially for voice and video communications. As you plan your network's coverage and capacity, take into consideration the physical layout of the hospital and the ways people interact in those spaces.

Assess your network performance

Your hospital's Wi-Fi network should be able to support multiple devices with simultaneous connections from all users throughout the entire facility. It's critical to assess your current WLAN environment's readiness for deploying iOS devices.

Where available, Apple Professional Services — in collaboration with your network integrator — can prepare an assessment of your wireless network. The assessment will indicate characteristics of your network that are ready for this mobile use case, list gaps that need to be addressed, and recommend next steps.

To learn more about Cisco network performance, refer to Enterprise Best Practices for iOS devices and Mac computers on Cisco Wireless LAN.

Enhance your Wi-Fi network for iOS devices

Having a consistent, dependable wireless network is critical for real-time data access. It's also essential for setting up and configuring iOS devices in your hospital. Apple and Cisco have optimized the network experience for institutions that use Cisco products and iOS devices. In addition, the content caching feature of macOS can speed up access to your hospital's most frequently requested apps and updates.

- **Optimized Wi-Fi connectivity.** Hospital wireless networks often need to support a high volume of traffic, and optimizing Wi-Fi can have a significant impact. As staff members move between patient rooms, iOS devices must be able to transition quickly between wireless access points without dropping their Wi-Fi connections, especially if they're making VoIP calls. iPhone must also have a reliable connection to the best available access points to provide staff with real-time access to critical data.

  Cisco enterprise wireless networks can automatically recognize iOS devices, enabling intelligent and efficient roaming to deliver high performance. Devices using iOS 10 or later and Cisco wireless access points perform a unique "handshake" that allows the devices to intelligently choose access points to connect to and quickly transition between them.

  If your institution uses Cisco products, IT can gain insight into how iOS devices operate in a given Wi-Fi environment. Analytics from Cisco Digital Network Architecture (DNA) and rich crowdsourced telemetry data from devices using iOS 11 or later allow a real-time client view of the network. This data can show how devices roam from one access point to another, as well as their performance throughout the environment.

- **Cisco Fastlane.** By using iOS apps that developers have optimized with QoS tags implemented by Cisco, IT teams can prioritize mission-critical apps to ensure they get the optimal performance. Through app prioritization, critical health apps that nurses, doctors, and other care team members use will get the best network resources to run optimally. For example, IT can give priority to a nursing VoIP app over a movie that a guest is streaming on the same network. Fastlane+ builds on this success by enabling Apple devices that use iOS 14 or later and support Wi-Fi 6 to efficiently stream high-quality voice and video content under congested RF environments.

  Talk to your Apple or Cisco representative to get the latest information about these networking features. Learn more about Cisco and iOS solutions.

- **Access to hosts.** Apple devices require access to a group of internet hosts to support important features like OS validation, certification verification, push notification delivery, and other services. Learn more about using Apple products on enterprise networks.

- **Content caching.** This macOS service helps reduce internet data usage and speed up software installation on Mac, iPhone, iPod touch, iPad, and Apple TV. Content caching speeds up the downloading of Apple-distributed software by saving content that local Mac, iPhone, iPod touch, iPad, and Apple TV devices have already downloaded. The saved content is stored in a content cache on Mac and is available for other devices to retrieve without going out over the internet. Content caching includes the tethered caching service, which allows Mac to share its internet connection with many iOS devices connected by USB. IT teams can manage this feature with MDM. Learn more about content caching.

Working with your Apple Authorized Reseller

Selecting a solution provider that meets all your nursing communications needs is a key step in a successful deployment. Once you choose an iPhone model, your solution provider will help you select the appropriate accessories for your clinical and operational needs. An Apple Authorized Reseller can provide financing and support options from Apple and other companies.

Choosing the right iPhone for your clinical needs

When selecting an iPhone device for deployment, take into consideration the various models' different technical specifications.

- **Screen size.** Many screen sizes are available to choose from, starting with iPhone 15 and iPhone 14 (6.1 inches diagonally) and iPhone SE (4.7 inches diagonally). In comparison, single-purpose devices for VoIP calls can weigh more and have a smaller screen.

- **Processing power.** iPhone 15 is powered by A16 Bionic — the smartest, most advanced chip in a smartphone. iPhone 14 and iPhone SE use the A15 Bionic chip. BCMA requires that chips have fast processing power.

- **Battery life.** For an assigned deployment, if nurses' shifts are only 12 hours long, hospitals can choose to deploy newer device models with longer battery life, like iPhone 15 or iPhone 14 — reducing the need for an added battery

pack. iPhone 15 and iPhone 14 support MagSafe accessories and wireless chargers, if external battery power is needed during a shift. All iPhone devices have the capability of fast charge, which charges the device up to 50 percent in 30 minutes with a
20W adapter (sold separately).

- **Camera resolution.** All iPhone devices feature a 12-megapixel camera with newer models supporting 48-megapixels. Some app vendors — such as Alertive, Altera, Careflow, Epic, Nervecentre, MEDITECH, and Vocera — use the native camera for soft scanning, enabling BCMA without requiring a specialized sled.

- **Splash, water, and dust resistance.** Under IEC standard 60529, iPhone 15 and iPhone 14 are rated IP68 and iPhone SE is rated IP67. The IP rating is a standard of measurement created to show how resistant a device is to dirt, dust, and water.

- **NFC reader.** iPhone 15, iPhone 14, and iPhone SE support native background tag scanning for reading NFC tags. This means that the system scans for and reads NFC data without requiring users to scan tags using an app. The system displays a pop-up notification each time it reads a new tag. After the user taps the notification, the system delivers the tag data to the appropriate app. If the iPhone is locked, the system prompts the user to unlock it before providing the tag data to the app.

Learn more about iPhone technical specifications.

Select accessories for your iOS devices

Your iPhone deployment may include a battery case and storage accessories that provide charging and protection to support a 24-hour shift cycle.

- **Case.** A simple case is recommended to protect the device from use in a hospital environment.

  Look for solution providers that support soft scanning using the built-in iPhone camera, which reduces cost by making a dedicated barcode scanner unnecessary.

- **MagSafe.** In an assigned or shared deployment, a clip-on battery pack that you can easily apply and remove during a shift is a convenient way to charge a device without permanently adding size or weight to it. MagSafe chargers can be placed at nurses' stations if needed.

- **Storage.** A storage unit serves a dual purpose: charging iPhone devices and cases, and securing them when not in use. Several products are available on the market from manufacturers like Griffin Technology and Cambrionix.

Establish a refresh cycle for your iOS devices

New versions of iOS support devices were released several years ago, giving iPhone a huge advantage from a return-on-investment perspective. But as many hospitals have learned, there are benefits to establishing refresh cycles for mobile devices — for instance, every two to three years. Regularly upgrading technology through leasing reduces compatibility issues and minimizes costs associated with using multiple generations of equipment. In addition, leasing equipment often means paying less over time than an initial cash purchase. It allows your institution to take advantage of the high residual value of iPhone.

If you're looking to finance new iPhone devices, Apple offers many flexible options. Learn more about Apple Financial Services.

Sign up for AppleCare support

It's strongly recommended that healthcare institutions deploying iOS devices purchase 24/7 AppleCare for Enterprise support for their deployments. This ensures that Apple resources are available to assist with troubleshooting for mission-critical communications or in the absence of additional IT resources. AppleCare programs help protect iOS devices, deliver advanced support for IT, and allow companies to service devices onsite.

- **AppleCare for Enterprise.** From 24/7 phone support to priority onsite repairs, personalized assistance from experts can help you keep your IT operations running smoothly.

- **AppleCare+ for iPhone.** Every iPhone comes with one year of hardware repair coverage through its limited warranty and 90 days of complimentary tech support. AppleCare+ extends that coverage up to two years and gives you additional features, such as 24/7 tech support and accidental damage coverage.

- **AppleCare OS Support.** Get the IT department–level support you need when deploying macOS, iOS, or iPadOS in your organization. AppleCare OS Support delivers phone and email support for integration, migration, and advanced server operation issues.

Learn more about AppleCare service and support.

Summary

With iOS, watchOS, and iPadOS apps, nurses can provide care more easily and intuitively while staying focused on patient interactions — much more than they can with single-purpose or stationary devices. A successful iPhone, Apple Watch, or iPad deployment for nursing includes app selection, integration services, network evaluation, and device and accessory selection. Apple can support deployment through financing and enterprise support programs.

By streamlining how nurses communicate, access the EMR, receive alerts, administer medication, document, and receive ongoing training, apps on iPhone and iPad can help reduce friction, increase productivity, and improve overall patient care.