



# Empowering Nurses, Enhancing Care

A step-by-step guide to reaching your care team  
collaboration goals.



# Index

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Introduction	3
Current State of the CC&C Market	4
Step 1: Begin With the End in Mind	5
Step 2: Define Important Workflow Enhancements	11
Step 3: Identify Required Integrations	18
Step 4: Select the Right Hardware	25
Conclusion	27
Getting Started	27
Sources	28

# Introduction

Nurses have many responsibilities. They handle a number of administrative duties, but they're primarily charged with providing high-quality care for their patients—the kind of care that requires an [abundance of collaboration and support](#). A 2018 time and motion study revealed that in four hours, nurses spend around 32 minutes communicating with patients and family and 51 minutes communicating and coordinating with members of the care team.<sup>1</sup>

**That's 34.6% of a nurse's time each day spent communicating, with only 16% spent on direct patient care.**

Nurses are responsible for communicating with patient family members, ancillary staff, care coordinators, and multiple consulting specialists. That's a lot to handle, and unfortunately, technology aimed at streamlining nurse communication has often missed the mark and compounded the problem. When asked to identify factors contributing to patient care errors, “nurses cited communication issues with physicians as one of the two most highly contributing factors.”<sup>2</sup>

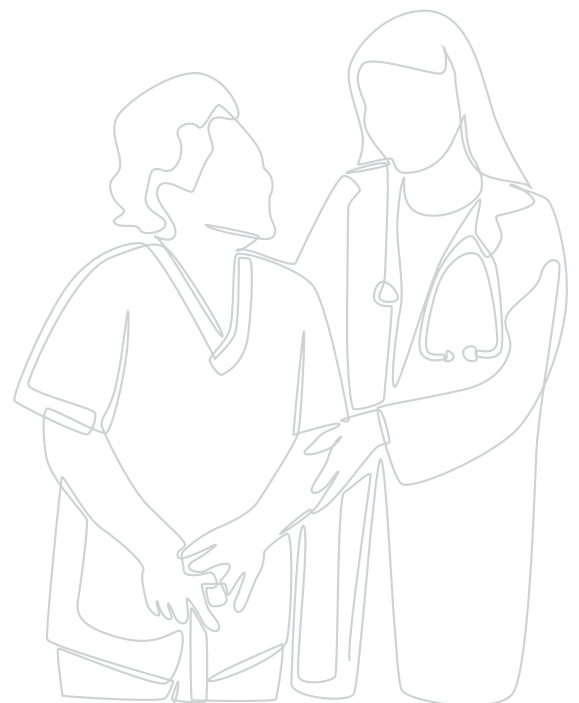
The American Academy of Nursing Workforce Commission's Technology Drill Down project found that nurses are frustrated by siloed, task-specific technology that requires workarounds and isn't user friendly.<sup>3</sup> In response, cutting-edge clinical communication technology has been created and refined to fill in gaps and return nurses to the bedside.

**Deployed strategically, an integrated clinical communication and collaboration (CC&C) solution can eliminate many nonclinical tasks and empower nurses to deliver faster, more attentive patient care.**

After helping hundreds of thousands of clinicians improve patient care through optimized communication, PerfectServe created this step-by-step guide to help organizations improve collaboration, streamline important clinical workflows, and refocus nurses' time on exceptional patient care.

**34%**  
of a nurse's  
time is spent  
communicating.

**Only 16%**  
is spent  
on direct  
patient care.



# Current State of the CC&C Market

Value-based care initiatives are driving requirements to converge secure text, interactive patient care technology, nurse call, alarms, notification platforms, call/transfer center technology, and even the EHR to support collaboration within and beyond the inpatient setting.

In leading organizations, clinical communication and collaboration (CC&C) platforms are often the cornerstone of broader initiatives to overcome care coordination challenges, improve transitions in care, and satisfy new patient experience expectations.<sup>4</sup> Advanced CC&C solutions check a lot of boxes: They address collaboration at an enterprise scale, consolidate and integrate siloed applications, help reduce vendor footprint, generate cost savings, and simplify clinical workflows to make it easier to provide patient care.

The following table covers a broad spectrum of functionality associated with CC&C platforms. These items represent:

- Core Functionality (C)
- Integration (I)
- Core or Integration, Depending on the Vendor (C, I)

Functionality	Typical Offering
Active Directory/LDAP	I
Alert & Alarm Management	I
Analytics	C, I
Automated Communication Workflow*	C
Barcode Scanning/Proximity Badges	C, I
Bed Management	I
Contact Center/Transfer Center	C, I
Critical Result Communication	I
Digital Rounding	C, I
EHR Management	I
HIPAA-Compliant Bi-Directional Texting	C
Mobile Device Management	I
Nurse Call	I
On-Call Scheduling	C, I
Pager Support	C, I
Patient Messaging	C, I
Patient Throughput	I
Physiologic Monitors	I
Real-Time Location Tracking	I
Smartphone, Tablet, & Web/Desktop Support	C
Telephony Support	C, I
Wayfinding	C, I

*\*Examples can be found under "Step 2: Define Important Workflow Enhancements".*

## STEP 1:

# Begin With the End in Mind

Start by challenging your assumptions about communication and collaboration. Attempting to automate your existing communication processes without first exploring opportunities for improvement would limit the potential of any new technology.

Ask yourself the following questions:

- What communication challenges exist today in your organization?
- Could any of the challenges you currently face be solved with better communication?
- Have you had any adverse patient outcomes as a result of poor or missed communications?
- What outcomes would you like to achieve throughout your organization?
- What are the key nursing drivers in your health system?
- How do you want your CC&C solution to improve patient care processes, reduce unnecessary steps, and maximize patient and clinician satisfaction?

Years of research and experience working with hospitals and health systems have revealed the following goals as top priorities for nurse leaders.



“When healthcare professionals communicate effectively—conveying critical information in a timely or easily understandable manner, clearly spelling out orders or instructions, and answering questions thoroughly and thoughtfully—they deliver safer and higher-quality care.”

—James Merlino, MD<sup>5</sup>



# Accelerate Decision-Making to Reduce Care Delays

In contrast, drawn-out and/or error-prone communication can delay treatments such as medication delivery, testing, and therapy. The consequences of a care delay can range from negligible to severe and may include an extended length of stay, exacerbation of illness,<sup>6</sup> late OR start times, clinician overtime, sentinel events, and more.

## Communication-related care delays may involve:

- Difficulty finding or interpreting the on-call schedule.
- Errors in the schedule leading the nurse to contact the wrong provider.
- Issues relaying information through office staff or the answering service.
- Trouble locating the nurse on the unit when a clinician calls back.
- Not knowing if a message has been received and acted upon.
- Restarting the communication process or escalating to another provider when a message is not returned.

An effective solution will reduce care delays by ensuring the correct care team member is immediately reached in every clinical situation. Streamlining message delivery eliminates errors and reduces communication cycle time (the average time it takes to receive a response from a care team member after sending them a message).

***Automating the communication process can [reduce response times](#) from an average of 45 minutes to [15-20 minutes](#).<sup>7</sup>***

# 25-60%

## Reduction in Communication Cycle Times

### PRO TIP:

Your current communication cycle times can be identified through time and motion studies. Goals for reducing communication cycle times vary across facilities.



# Improve Care Quality

An advanced CC&C solution should facilitate the following:

- **Timely Critical Result Notifications**  
Dangerous and costly complications—such as transfers to the ICU, additional medication, and cardiac arrest—can be mitigated or avoided by ensuring the on-call provider is rapidly notified about abnormal lab values (e.g. low potassium) and critical radiology results (e.g. signs of a pulmonary embolism).
- **Reduction of Code Blue Events**  
Two ways the right CC&C solution can support early intervention to address signs of patient deterioration:
  - Automatic relay of alerts such as MEWS (Modified Early Warning Scores—a physiologic scoring system used to detect early deterioration) to the correct on-call provider.
  - Faster and more accurate manual notifications sent by the care team to the appropriate on-call provider.
- **Rapid Response Team Mobilization**  
For speedy, efficient mobilization of resources, advanced CC&C solutions allow care team members to use their mobile phone to instantly activate designated response teams (e.g. code stroke or code STEMI), notifying all team members of emergency details.
- **Improved ED Throughput**  
Overcome challenges to ED throughput communication—such as specialist and surgical team availability, diagnostic service and procedure coordination, reaching on-call providers, and transfer coordination—with a solution that expedites communication to decrease response times, increase bed access, and reduce patient wait times. Improved ED throughput can be improved by better communication in a few different ways:
  - Having ER on-call schedules readily available on mobile and desktop apps expedites access and connection
  - [Integrated consult routing](#) on new admissions reduces the need for unit secretary intervention and reduces delays in care
- **Reduced Length of Stay**  
Cutting communication cycle times by 15-20 minutes expedites care and allows for faster transfer out of the emergency department (ED), post-anesthesia care unit, and ICU, freeing up beds for new admissions.

## Organizational Goals May Include:

**35%**

Faster Critical Result Acknowledgment

**20%**

Reduction in Code Blue Events

**30%**

Faster Rapid Response Team Arrival Times

**20%**

Reduction in Patients Leaving the ED Before Being Seen

**5%**

Decrease in Length of Stay

# Increase Referrals by Optimizing Transfer Center Operations

Referrals are a major source of patient admissions and revenue for tertiary care centers, but many health systems find the transfer process to be both cumbersome and inconsistent. Referring physicians are frequently transferred to the accepting physician specialist or emergency room personnel, who then contact the nurse supervisor, who in turn contacts bed control to ensure availability.

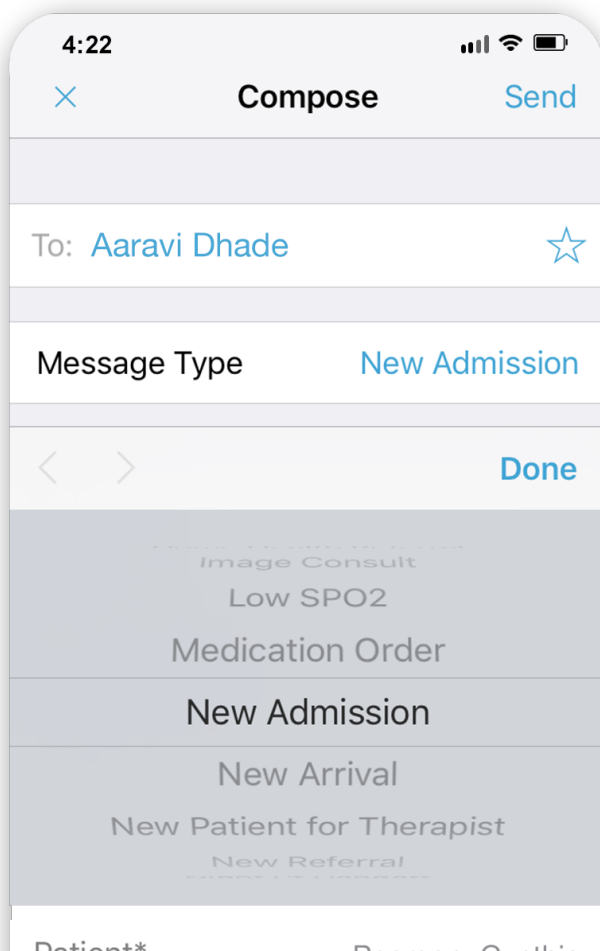
***Multiple handoffs lead to delays in patient care, frustrating experiences, and lost referrals.***

A state-of-the-art CC&C solution reduces the time required for contact/transfer center personnel to reach providers, arrange transfers, and move patients to their assigned beds. The impact of a CC&C platform on an your admission volume will depend on current referral activity but should range from +5-10%.<sup>8</sup>

## 5-10% Increase in Admissions

### PRO TIP:

Evaluate your current transfer processes by surveying your nurse supervisors and bed control personnel, estimate the potential impact of process improvements on your organization's referral rates, and use current referral statistics to calculate corresponding revenue.





# Increase Patient Satisfaction

The Hospital Consumer Assessment of Healthcare Providers and Systems (more commonly known as HCAHPS) surfaces data about patient perspectives of care for consumer comparison, increasing accountability and incentivizing hospitals to improve their quality of care. Some hospitals struggle to obtain the requisite 300 completed HCAHPS surveys throughout the 12-month reporting period.

A CC&C solution can help in two important ways:

1. Improving the Patient Experience
2. Encouraging Patients to Complete Surveys

Patient perceptions of six out of 10 key HCAHPS topics can be addressed by improving care team communication:

- Nurse Communication
- Doctor Communication
- Responsiveness of Hospital Staff
- Pain Management
- Quietness of Hospital Environment
- Understanding of Care Post-Discharge

The best way for organizations to capture positive patient perceptions is to text message patients with links to complete surveys on their phone. With 96% of adults on cell phones<sup>11</sup> and texting the number one cell phone activity, text messages that link directly to surveys can drive more patient participation.

**1-2 point**  
Increase on Each  
Measurement  
Criteria<sup>9</sup>

**40-50%**  
Increase  
in Survey  
Response  
Rates<sup>10</sup>



# Reduce Readmissions

The nationwide quest to avoid preventable readmissions employs a variety of strategies to engage patients post-discharge, the most common being for nurses and care coordinators to call patients at home to collect assessment data and reinforce educational materials. But with the escalating frequency of robocalls, patients are increasingly likely to ignore unexpected calls, creating a frustrating game of phone tag between nurses and patients.

A CC&C solution that includes automated text messaging with patients can reinforce treatment instructions while encouraging specific next steps (e.g. filling a prescription or scheduling a follow-up visit). Two-way texting can be used to gather patient responses and monitor key health indicators (e.g. blood glucose levels). An advanced solution can even highlight responses outside of the expected range, flagging patients at higher risk for readmission so nurses can focus their outreach efforts most efficiently.

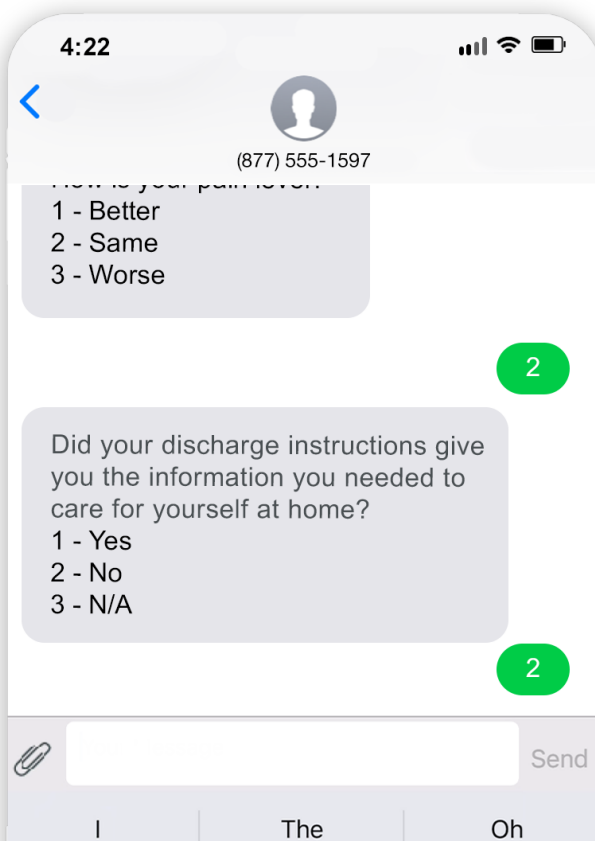
Powerful benefits of patient texting include better care plan adherence, decreased readmissions, more satisfied patients, reduced labor costs, and the enhanced ability of nurses to practice at the top of their licensure.

# 30%

## Decrease in Readmissions

### PRO TIP:

Identifying your target readmission reduction rate depends on historic program effectiveness. Organizations that have had limited success should strive for a 20-30% reduction.<sup>12</sup> Calculate estimated savings based on the average readmission cost per patient.



## STEP 2:

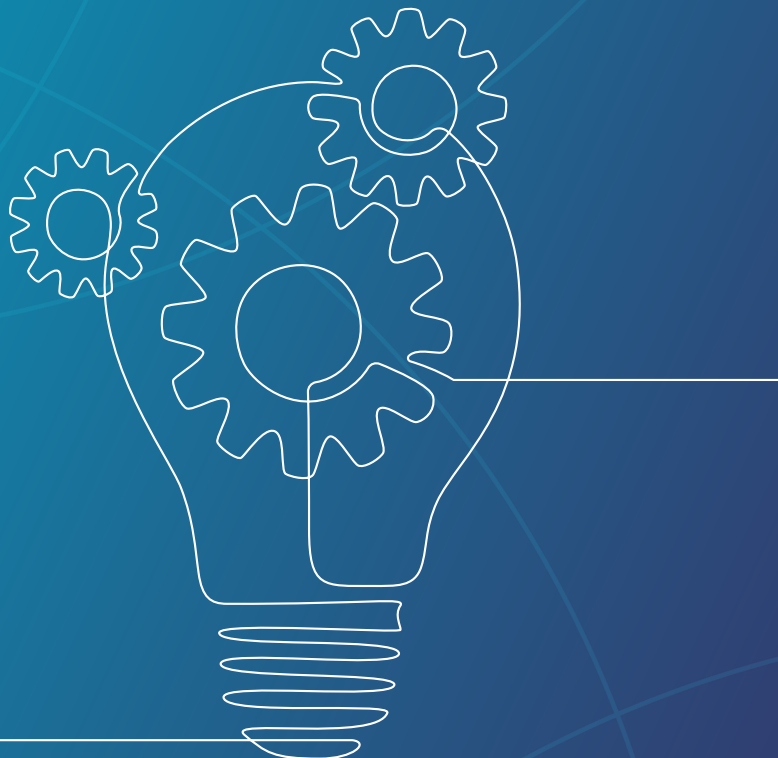
# Define Important Workflow Enhancements

Technology vendors may look similar on paper, but the right CC&C solution will simplify a wide range of communication-related workflows by eliminating steps and speeding up processes to improve clinician and patient satisfaction. Organizations looking to optimize mobility and care team efficiency should focus first on the workflows most in need of improvement.

True efficiency only comes from a comprehensive solution. Avoid purchasing narrowly focused technology built to address limited challenges. Skim past the ambiguous feature lists and examine the use cases, which can help you envision specific scenarios and map out desired workflow improvement goals.

The degree to which a CC&C solution can simplify your communication likely depends on the flexibility of its rules engine and routing mechanisms. The solution with the right capabilities will:

- Offer several nursing workflow improvements
- Remove extra steps from the following communication processes



# 1 Care Team Assignment

How much time each day do your nurses spend calling departments and waiting on hold to locate the assigned care team member?

Efforts to track down the assigned patient care technician, respiratory therapist, physical therapist, pharmacist, or other care team member can be frustrating, with assignments sometimes stored in several different places, such as the EHR and nurse call system. Integrating all patient assignment sources allows nurses and other care team members to view and contact each patient's assigned care team with ease.

# 2 Role-Based Assignment

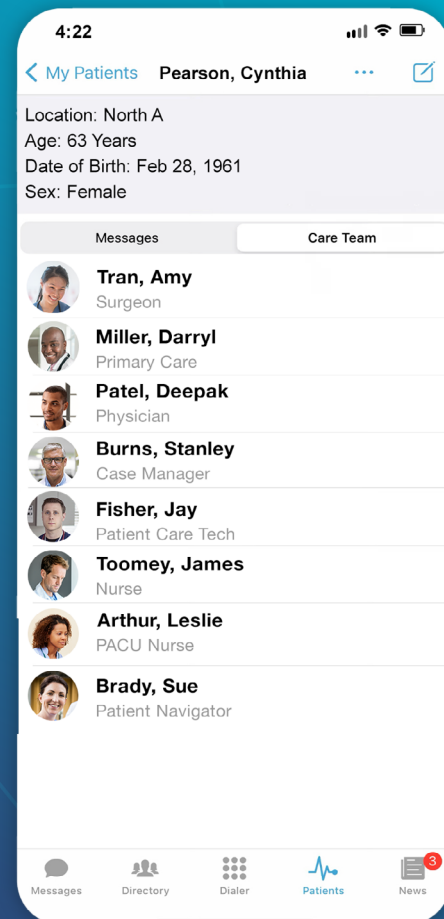
How often do team members wait on hold while a unit charge nurse is located? How long are patient transfers delayed by trying to obtain bed assignments or transfer assistance?

Locating personnel in specific roles (e.g. ICU charge nurse, nurse supervisor, patient transport coordinator, etc.) is often time consuming. Staff throughout the organization should have the ability to easily message care team members in role-based assignments from the CC&C solution, whether the right team members are identified through application integrations or self-assignment of roles.

# 3 Physician/Service Coverage

How often do your nurses call the attending physician of record to discover they're no longer the primary physician, or they're not on call for the patient today?

Information stored within the EHR about the admitting or attending physician is often out of date. Much like the care team assignment functionality described above, integration with multiple sources allows a sophisticated CC&C solution to identify the correct physician of record and the most current on-call schedule to ensure the right provider is reached.



## 4 Call Schedule Management

How frequently do your nurses call the wrong person in the middle of the night trying to reach the on-call provider?

Paper call schedules are difficult to maintain because shift assignments change throughout the month. Distributing printed copies across departments also takes time and resources. With a CC&C solution that includes electronic call schedule integration and management, nurses can enter a simple search such as “cardiologist” and instantly initiate a call or secure message to expedite treatment. Users should also be able to search for a certain patient’s cardiologist, as just one example. Clicking to contact an off-duty provider should trigger an alert that says something like this:

“Dr. Smith is not on call at this time. Dr. Jones is currently providing coverage. Would you like to connect with Dr. Jones or proceed with calling Dr. Smith?”

## 5 Voice Calling

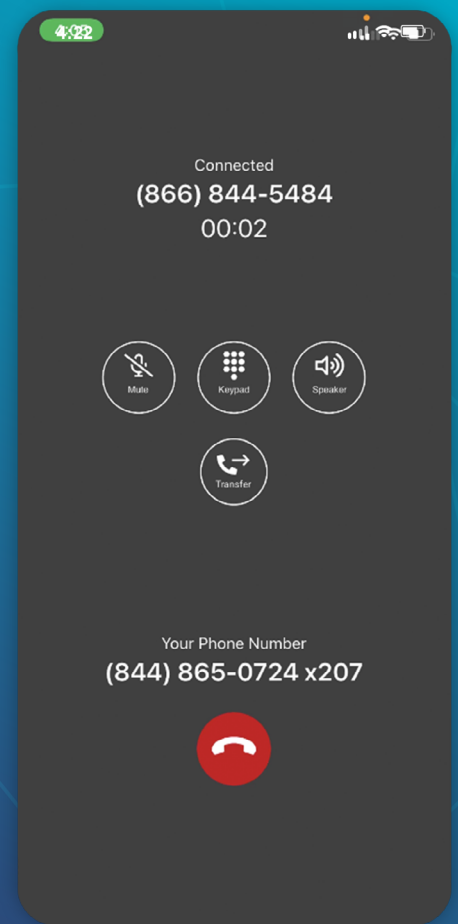
Do your nurses sometimes get confused when toggling between the EHR, messaging applications, and telephone app?

Toggling between a messaging application and phone dialer is a frustrating user experience. Modern CC&C applications integrate with the smartphone’s native dialer or incorporate voice calling to dial out directly from the messenger app. Additional integration with the organization’s telephone system ensures that users can call any existing four or five-digit extensions from their smartphone, even from off site.

## 6 Call Masking

How often is patient care interrupted when patient family members call the nurse’s direct mobile phone number?

Nurses’ direct phone numbers are often inadvertently exposed to patients and/or family members through caller ID. Call masking prevents patients from accessing your staff’s mobile phone numbers by displaying the main unit or organization phone number on the caller ID instead.





## 7 Hold Nonurgent Messages

Have your nurses been reprimanded for waking a provider with a nonurgent message? Has your team failed to remember/relay a nonurgent message or consult in the morning?

Managing nonurgent messages overnight can be a challenge. Your CC&C solution should include qualifying questions for off-hour communication and the option to hold nonurgent messages until normal working hours, at which point they can automatically be delivered to the appropriate recipient.

## 8 Multiple Alert Tones

How many times a day do important care processes (medication administration, patient education, clinical procedures, etc.) get interrupted by nonurgent message alerts?

An alert that disrupts a clinical task or procedure is particularly frustrating when the message can wait. A CC&C solution with multiple alert tones and customization options helps clinicians instantly differentiate the nature of each message (urgent, nonurgent, physician reply, etc.), physiologic monitor, and alarm to help nurses determine if they need to stop what they're doing to check the message.

## 9 Read Receipts

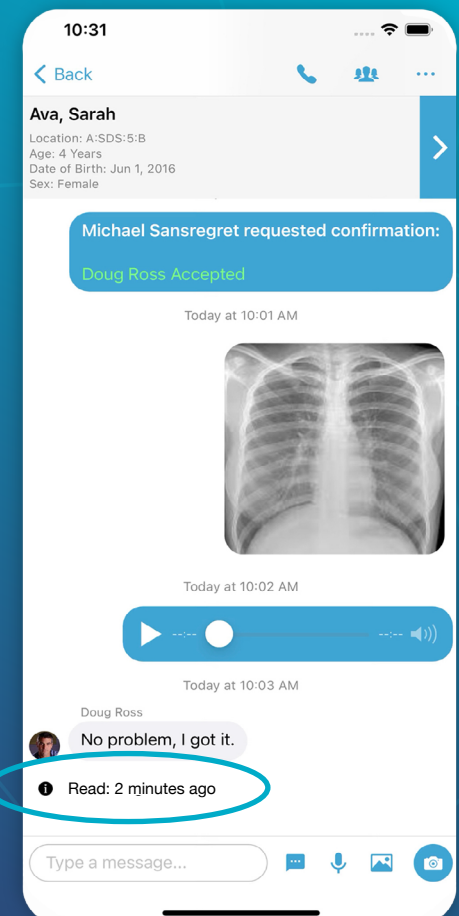
How often are nurses left wondering if a physician or care team member has received their message? How long do nurses wait before sending another message?

Date and time stamps provide visibility into the delivery and receipt of patient care messages to remove ambiguity and ensure issues are addressed in a timely manner.

## 10 Mass Notifications

How does your organization communicate to all employees throughout a major event, such as a hurricane or snowstorm? How is staff kept informed about the status of planned or unplanned EHR downtime?

A CC&C platform should provide fast, reliable delivery of emergency messages to all users or certain groups within the organization. Mass notification capabilities help keep staff informed before, during, and after critical events such as natural disasters or system outages.





# 11 Unavailable Mode

How often do staff members receive calls back from the OR circulating nurse to say the provider is unavailable? How much time lapses between the initial message send, manual escalation to another provider, and resolution of the issue?

Care delays often occur because physicians or nurses are in sterile procedures and cannot be interrupted. Advanced CC&C technology allows users to indicate if they're unavailable. If a care team member tries to message someone who's not available, the sender gets the option to reroute the message to the covering provider or send to the unavailable recipient anyway (to be addressed after the procedure is complete).

# 12 Automatic Escalation

How long do your nurses wait before escalating urgent messages? Do they ever get delayed by patient care and take too long to escalate a message to another provider or manager?

Manual escalation requires nurses to recognize the need to escalate and choose the appropriate timing for escalation. A smart CC&C solution can remove manual escalation decisions and support rapid issue management by auto-escalating urgent messages not acknowledged within a specific timeframe to the next-level provider or manager.



## 13 Care Continuity During Shift Change

How much nurse time is wasted trying to contact respiratory therapists, nurse managers, or physicians after their shift has ended? How does it impact the time required to address patient needs?

Trying to reach a provider or care team member who has gone off shift creates frustration and delays issue resolution. The right CC&C solution will indicate when a provider is no longer on call and offer the option to start a new conversation with the on-call clinician, saving time and improving satisfaction.

## 14 Group Message Threads

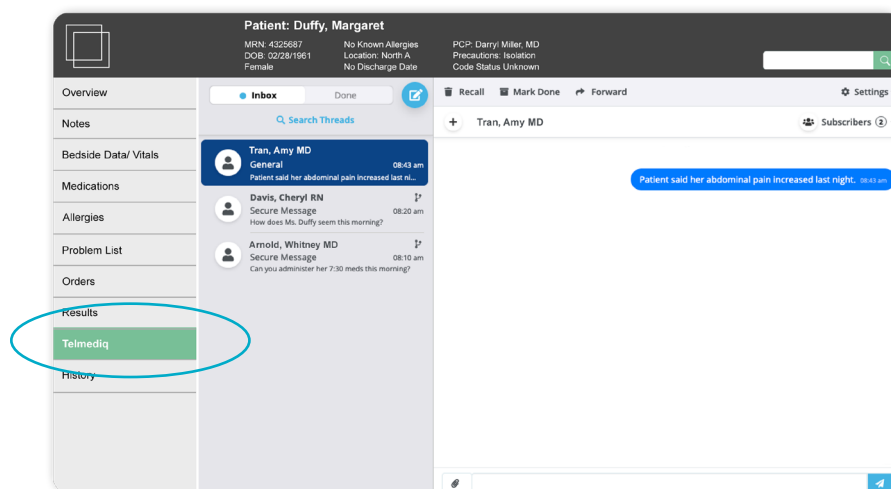
How often are orders or discharges delayed because care team members are operating without complete information?

Nurses tend to start multiple communication threads with different team members as needed, and then wind up mediating across threads as care progresses. An advanced communication solution supports group messages and allows care team members to be added to existing threads to see the full conversation history for a complete understanding of the patient's needs.

## 15 EHR Integration

Do your clinicians toggle between your communication system and your EHR, sometimes having to manually type patient information from the EHR into a message to ensure proper context is relayed?

Working in two separate systems—one for documentation and another for communication—is cumbersome for nursing staff. An advanced CC&C solution integrates with the EHR to simplify this important workflow. (Learn more in Step 3: Identify Required Integrations).



## 16 Access to Out-of-Network Providers

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How do your nurses connect with out-of-network providers today? Phone lists in the unit? The hospital operator? How do your clinicians ensure HIPAA-compliant communication with out-of-network providers? How often does your team experience communication failures when trying to reach outside providers?

Communication processes often break down when clinicians try to reach a provider outside their network, such as a dialysis center or rehabilitation facility. CC&C technology should span the patient's entire care ecosystem to ensure consistent and reliable communication that expedites planning and transitions of care.

## 17 Rapid Response Team & Code Team Deployment

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Do your clinicians have to call the operator to activate a rapid response team? How long does it take? How do they know when team members will arrive?

Advanced CC&C technology can manage multiple teams for specific emergencies such as sepsis, stroke, myocardial infarction, full cardiac arrest, etc. A user can quickly activate the relevant team from their smartphone to immediately relay the nature of the event and the patient location to appropriate personnel. Designated code team members receive the message simultaneously and all recipients can view each team member's read receipts and replies.

## 18 One Unified Communication Platform

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As nurses and providers look to break down silos in communication workflows, it's essential to ask questions about the continuity of your system's communication solutions. Can nurses easily connect with the entire care team to ask questions or find patient information? Can they search for the right on-call provider quickly without leaving the communication platform? Do the solutions in place tightly integrate to support more streamlined and collaborative communication?

A CC&C solution that supports advanced communication workflows should take a one-platform approach, ensuring all care team members work on a single, integrated, HIPAA-compliant platform. This limits the need to jump between programs, ensures messages are delivered to the right provider and are escalated when needed, and is accessible across mobile devices to keep nurses moving to and from every patient under their care.

## STEP 3:

# Identify Required Integrations

Clinicians will only use new technology that delivers significant workflow benefits—ease of use, faster care, increased patient throughput, better outcomes, etc. That means your clinical communication solution needs more than basic secure messaging functionality. To best support adoption, compliance, and unified communication, your solution must integrate with the following key hospital systems and devices to simplify workflows right from the start.



# EHR

Nurses spend a great deal of time communicating and documenting, making integration between the CC&C platform and the EHR critical. Patient lists and care team assignments support accurate routing, and new orders and results often serve as the impetus for action. Tight integration with Epic, Oracle Health, and other EHRs saves nurses countless hours that would otherwise be spent toggling between applications, searching for data, and manually typing information into text messages.

## Embedded Messaging

Embedded the CC&C platform directly in the EHR allows staff to initiate CC&C-powered communication without leaving the EHR environment. This automatically ties patient context into the message to reduce the amount of information clinicians have to enter manually. Likewise, staff can launch the mobile EHR app from the CC&C application with deep links to review information or document care, eliminating the need to toggle between applications or leave one solution to open another.

### USE CASE

A nurse receives a message through the CC&C app that the physical therapist would like to visit patient Smith in room 404 to begin rehabilitation in 30 minutes. The nurse taps a deep link to launch the mobile EHR app directly from the message and reviews the medication administration record. Since the patient's last pain medication dose was four hours ago, the nurse visits patient Smith to assess her level of pain. The nurse decides to administer another dose of pain medication to ensure that patient Smith can maximize the value of her physical therapy. She then replies to the physical therapist that pain medication has been delivered and patient Smith is expecting the visit.

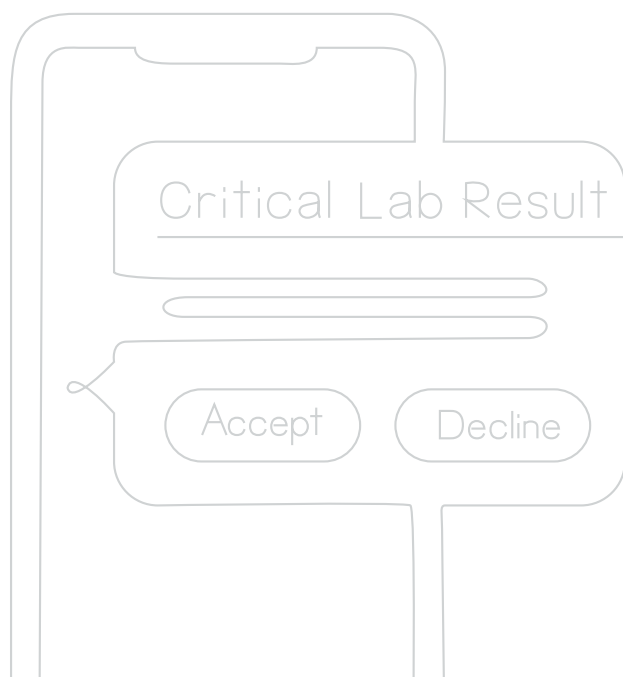


## STAT Order Notifications

The ability to access the EHR from any location creates opportunities for order entry without concurrent communication between doctors and nurses. Integration with the EHR enables the automatic notification of all appropriate personnel about new STAT orders to minimize care delays.

### USE CASE

While rounding on a patient, a physician writes a STAT order in the EHR for intravenous potassium. The pharmacist and the patient's nurse receive an alert through the CC&C app on their smartphones that includes the patient name, room number, and STAT order details. The pharmacist and nurse can both prioritize the new order and expedite the delivery of the potassium.



## Critical Laboratory and Radiology Results

The Joint Commission's National Patient Safety Goal 02.03.0113 requires organizations to report critical results of tests and diagnostic procedures on a timely basis. Unfortunately, some organizations struggle to measure compliance and meet their goals. Integration with a modern CC&C solution helps ensure that results are immediately delivered to the appropriate provider (either the ordering physician or the covering on-call provider), escalated within specific timeframes if necessary, and documented for auditing purposes. Automated routing saves lab and radiology technicians countless hours each month.

### USE CASE

A patient's blood culture results reveal a serious bacterial infection. The ordering provider has handed care off to her partner for the evening, so the CC&C platform automatically routes the result notification directly to both the covering provider and the nurse caring for the patient. The covering provider acknowledges the alert and adds a note that she will change the antibiotic order in the EHR. All messages are automatically relayed to the laboratory department and the nurse taking care of the patient. System reports help the lab evaluate response times, evolve quality improvement efforts, and provide documentation for The Joint Commission.



## Clinical Surveillance Alerts

Advances in clinical surveillance provide hospital staff with early warnings of potential patient compromise including sepsis, respiratory deterioration, organ failure, etc. As algorithms constantly evaluate new information to determine risks, CC&C technology should rapidly route any alerts to the appropriate clinical staff.

### USE CASE

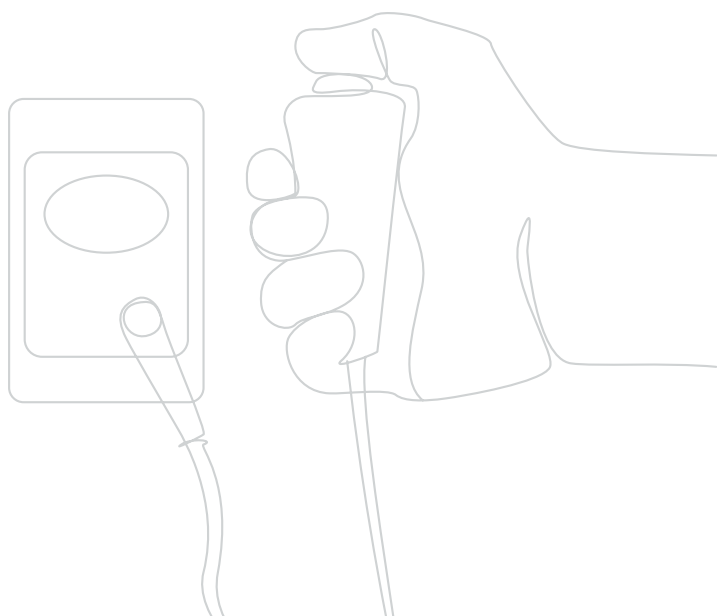
The rule-based sepsis screening tool identifies a potential case of sepsis. The CC&C platform receives a sepsis notification and immediately alerts the patient's care team about the risk. Since the attending physician is not on call, the alert is automatically routed to the covering physician. The patient's bedside nurse is performing a sterile dressing change and does not read the message within 10 minutes, so the system automatically escalates the sepsis alert to the charge nurse on the unit.

## Nurse Call System

A recent study found that only 52% of bed calls require nursing care; all others can typically be answered by support staff.<sup>13</sup> If your organization has a next-generation nurse call solution that provides request details, supports task assignment, and enables callbacks from mobile devices, integrating it with the right CC&C solution will help nurses focus on clinical work while delegating other tasks to the care team.

### USE CASE

A patient presses the “water” call button. The CC&C platform receives the request and automatically routes the message to the patient care technician, preventing the nurse from getting distracted by a nonclinical request. Later, the patient presses the general call button and the assigned nurse receives the message. The nurse clicks on the message to call back to the room from her smartphone. She has a quick conversation with the patient to determine if a trip to the patient's room is needed.



## On-Call Schedule

With a modern CC&C solution, scheduling applications that manage on-call shifts can be integrated to ensure all calls and messages are delivered to the correct on-call provider. If provider groups are using different scheduling tools, the CC&C platform should integrate with each tool to ensure timely and accurate communication across the continuum.

### USE CASE

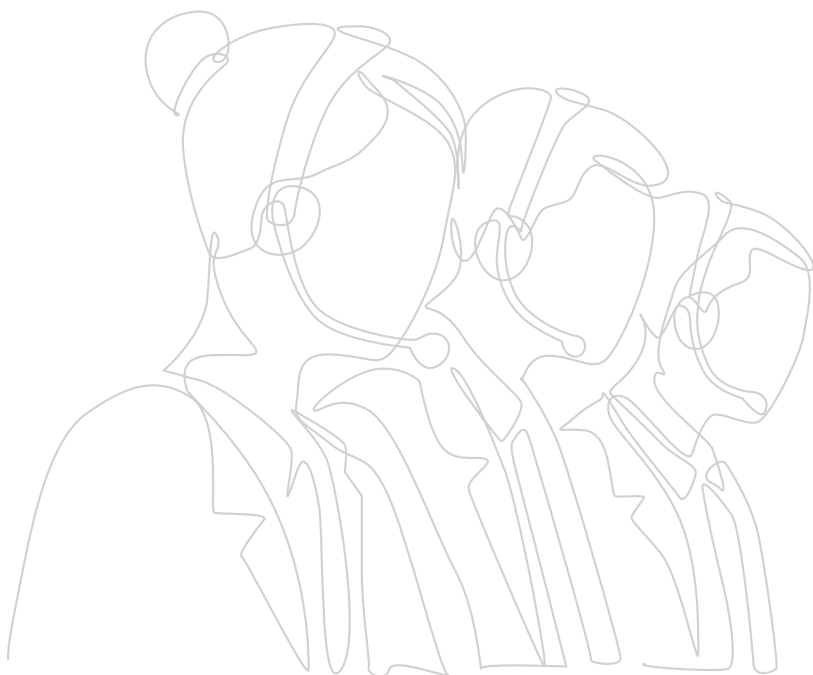
A hospitalist asks a colleague to swap shifts this evening because his child is ill. The swap is completed in the scheduling application. Later that evening, when the ICU nurse messages the on-call hospitalist, the application automatically routes the message to the substitute instead of the originally scheduled hospitalist.

## Call Center

Integrating the CC&C solution with the call center system brings HIPAA compliance and streamlined workflows to the hospital's switchboard, transfer center, and answering service. Operators can call and send secure messages with patient details directly to the smartphone of the clinician.

### USE CASE

An operator receives a call from patient Smith's husband, who would like to speak to the patient's nurse. The operator sends a text message to the nurse asking if he is available to speak with Mr. Smith. The operator sees the message was read and receives a reply that the nurse is finishing lunch and would prefer to call Mr. Smith back in 10 minutes. The operator responds to the message with Mr. Smith's phone number. The nurse initiates a call to Mr. Smith 10 minutes later by clicking on the phone number in the text message.



# Authentication Infrastructure

Integrating with Active Directory or a single sign-on (SSO) system facilitates easy provisioning of users onto the CC&C platform and allows users to authenticate using their pre-established health system credentials. Active Directory integration also helps users more easily find and contact anyone in the organization by providing the most current names, roles, and contact information for all personnel.

## USE CASE

At the beginning of the shift, a nurse selects a smartphone from the charger bank and uses her proximity badge to log into the device and the communication platform simultaneously—no need to enter credentials. When the smartphone is returned to the charging station, the nurse is automatically logged out of the system. The system actively keeps track of which nurses are on duty.



# Pagers

Some large health systems may want to retain pager technology and/or ease the transition to smartphones by using both pagers and smartphones in tandem. To successfully leverage both device types, a CC&C platform must be able to send messages to pagers using the appropriate communication protocols while filtering Protected Health Information (PHI) since pagers are unsecure (i.e. they do not require authentication to read messages).

Solutions can allow clinicians working across health systems (and pager networks) to send and receive messages to and from each organization with a single device. Clinicians can be assigned a “pager number” within the CC&C app to ensure pages are routed to their smartphones.

## USE CASE

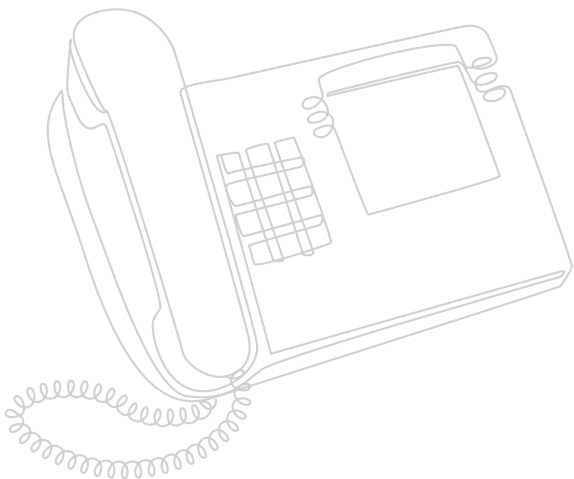
An orthopedic surgeon operates at two organizations: a private surgery center and a large teaching facility. When the teaching facility implements a CC&C solution, the surgeon wants to eliminate the two pagers she carries (one for each facility), but the private surgery center does not plan to implement the CC&C solution. She also wants to avoid changing numbers or becoming difficult to reach. The surgeon works with IT to integrate her private surgery center pager number with her CC&C profile, ridding herself of pagers moving to a new setup where all messages are routed to her smartphone.

## Hospital Phone Systems

Phone system integration allows users to dial and receive calls within the CC&C application on their smartphone and from any phone on campus or within their network. A CC&C solution can operate like a Private Branch Exchange (PBX) system, using a Voice over Internet Protocol (VoIP) dialer to allow users to dial four or five-digit department extensions they've memorized over the years. The PBX dialing feature prevents users from having to pick up a hospital desk phone to dial an extension or launch the telephone app on their smartphone to dial the full seven-digit phone number.

### USE CASE

A case manager has left the hospital campus and receives an alert about a critical lab result. To ask a question about the result, the case manager simply dials the lab's four-digit extension from the CC&C application where she received the alert.



## Alarm Management Technology

Alarm management middleware prioritizes and filters event notifications and relays relevant patient and event context to the care team. Integration with modern CC&C technology supports appropriate message routing and escalation on the same platform managing other communication activities.

### USE CASE #1

A patient's monitor leads fall off. The alarm middleware detects that the leads are off for more than 10 seconds, which triggers an alert to the CC&C platform. The platform sends a "Leads Off" alarm to the nurse assigned to the patient. The nurse is unable to respond to the alarm within 30 seconds, so the alarm is escalated to the charge nurse. The charge nurse heads to the patient's room to resolve the issue.

### USE CASE #2

A confused patient attempts to get out of bed unassisted. The communication platform relays the bed exit alarm to all staff on the unit: "Bed Exit: Room 100." All available staff members quickly respond to room 100 to prevent a dangerous—and maybe even life-threatening—fall.

## STEP 4:

# Select the Right Hardware

[The right smartphones](#) have the power to transform nursing workflows for the better. Nurses and other care team members need ruggedized devices that can be thoroughly sanitized, easily carried, and used to access all required applications while appearing professional (so patients don't think their clinician is playing on a personal cell phone).

Most importantly, clinical devices need reliable connectivity, which can only be assured through careful vetting, selection, and maintenance by the health system. Consider the following aspects:

## Wi-Fi Network

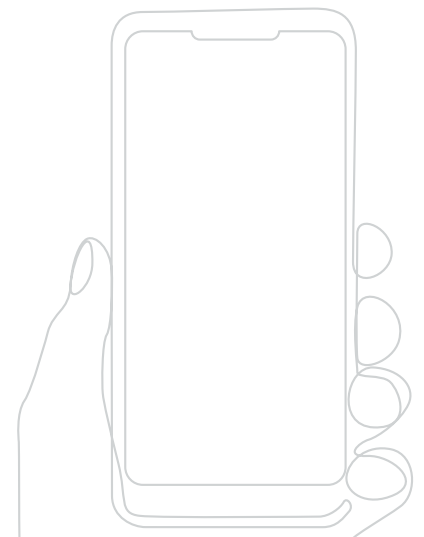
One of the most common failure points of a mobile communication strategy is the Wi-Fi network. As more devices tax the system and the volume of data crossing the network increases,<sup>14</sup> IT departments must conduct thorough bandwidth testing to identify and eliminate dead spots before adding new devices.

## Mobile Device Management (MDM) Software

MDM software centralizes the management of planned and reactive maintenance to minimize downtime, extend equipment life, and reduce budgetary spend. Organizations can use MDM tools to set up and perpetuate updates, upgrades, and patches across all devices, as well as to help identify security issues and seamlessly address them across the entire fleet before major problems develop.

## Device Maintenance

Shared devices need their own strategy. Plan for modular charging, efficient maintenance, and regular disinfection. Let patients know the devices are being used for clinical work, possibly with branded device sleeves/battery packs.



## Device-Specific Features

Applications function differently when it comes to authentication processes and security measures. It's important to account for functionality and to consider how a device will function based on an organization's unique requirements. The table below describes device-specific features to consider when selecting smartphones for clinical use:

Feature	Consideration
<b>Battery Life</b>	<ul style="list-style-type: none"><li>• Operates for at least 12 hours under high-use conditions</li><li>• Potential for extended-life cell phone batteries incorporated into ruggedized cases and/or swappable batteries</li></ul>
<b>Enterprise-Grade Wi-Fi</b>	<ul style="list-style-type: none"><li>• Test your Wi-Fi network to ensure devices don't roam between access points and drop calls</li></ul>
<b>Voice over Internet Protocol (VoIP) Functionality</b>	<ul style="list-style-type: none"><li>• Support for VoIP calls natively</li></ul>
<b>Durability</b>	<ul style="list-style-type: none"><li>• Shock resistance for falls up to six feet</li><li>• Fluid resistance</li></ul>
<b>Cleaning and Disinfection</b>	<ul style="list-style-type: none"><li>• Screens and casings made to tolerate hospital-grade disinfectants</li></ul>
<b>Integrated Scanners and Cameras</b>	<ul style="list-style-type: none"><li>• Ability to scan barcodes and support medication administration, wound photography, etc.</li></ul>
<b>Compatibility</b>	<ul style="list-style-type: none"><li>• Support for all required apps and systems deployed at the organization</li></ul>



# Conclusion

Clinical communication and collaboration technology has evolved into a system-wide backbone for all care coordination activities. Nurse leaders can eliminate silos and consolidate important patient care functions into a single solution by taking an outcomes-driven approach to system evaluation, deployment, and measurement of success. Choose a solution that addresses the holistic needs of your organization to reduce care delays, improve patient safety, streamline workflows, and generate a strong return on investment. The right investment into an intelligent nurse mobility platform will maximize any other investments made to expedite care delivery, such as deploying smartphones for nurses.

Evaluate solutions against your organization's goals for process improvement, desired workflows, and required integrations. The best CC&C solution will lead to reduced communication cycle times, fewer care delays, improved care performance metrics, decreased readmissions, and, quite simply, better patient care.

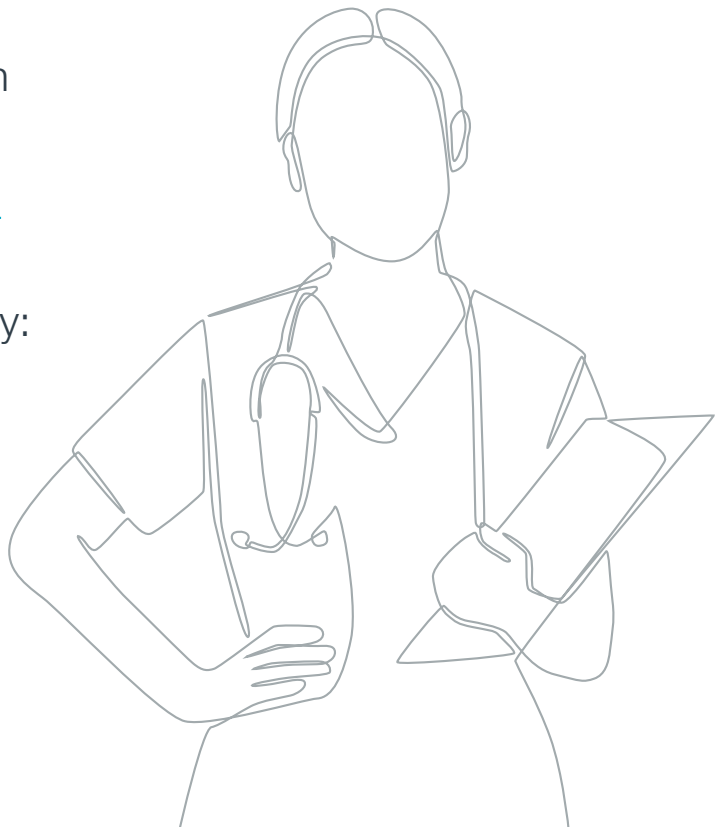
## Getting Started

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