Clinical Communication and Collaboration in Acute Care Settings

Connecting the Care Team with Patients and Critical Events Using the Vocera Engage Platform

A 32-year old female, 29 weeks pregnant, enters the ED with a rapid heart rate along with labored breathing and shortness of breath. The patient is rapidly triaged through to the primary ED nurse, who connects the patient to the physiological monitor. Immediately, the monitor generates an alarm for a heart rate of 140bpm and a limit alarm for a respiratory rate of 24rpm. The patient is placed on SpO2 via nasal cannula. The ED physician contacts the patient’s primary care physician. Standard ED orders are entered into the EHR (electronic health record), STAT labs and a diagnostic ECG are ordered, as well as an OB consult for mom and baby, and a cardiology consult for mom.

Coordinating care for mom and baby demands a unified approach. Using the Vocera® Engage Platform, an event driven care team communication application for smartphones, the primary ED nurse receives STAT lab results in addition to abnormal physiological heart rate, arrhythmia, and respiratory alarms. As a logical next step, the nurse forwards this vital information to the ED physician’s mobile device. The ED physician, upon receipt of the abnormal patient alarm values, decides to send a secure text message to both his cardiology and obstetrics colleagues on call. The secure patient information embodied in the threaded message includes: a) the actual alarms generated from the physiological monitor; b) STAT lab results; c) a description of existing patient symptoms; and d) the urgent need for expert consultation to determine baby's status and potential for a premature delivery.

The primary ED nurse sends an urgent text message to the manager of the OB-GYN unit to confirm the physician order to evaluate baby’s status via a fetal monitor in the ED. Using the dynamic care team directory, the nurse then adds the Critical Care nursing director and the OB-GYN nursing director to the conversation thread – along with an explanatory text. Meanwhile, the OB nurse following the baby’s needs hooks up the fetal monitor, and determines that the baby’s heart rate is consistently at 100bpm, and communicates this finding to the primary care physician, now on site and standing in the vicinity of the patient and OB nurse. The physicians (primary, obstetric, and cardiology) decide that the situation warrants an emergency C-section.

The Delivery Room nurse initiates a threaded message to both patients’ (mom and baby) care teams; the Director of OB-GYN, the Manager of the NICU (neo-natal ICU), the Director of Critical Care, and the Manager of Cardiac Step-down, to alert the team that baby will be rushed and admitted to the NICU, while mom will be transported to the Cardiac Step-down unit to be stabilized.

Over the course of the first twelve hours of the patients’ admission, a dozen clinical professionals were consulted to communicate and coordinate on care including the primary physician at a remote location outside of the hospital. It takes a diverse team with well-orchestrated communication and care coordination to deliver clear-cut, effective, and comprehensive care to mom and baby. Can you imagine as a clinician having to thumb through multiple apps on a smartphone to share STAT labs, physiological alarms, patient symptoms, or other pertinent information with several care team members, simultaneously, or trying to transcribe this information on a mobile phone from a basic messaging app? The Vocera platform integrates all of this information into a single application to streamline the communication and care coordination process.
Managing Emerging Communications to Prevent Clinical Interruptions

Interruption fatigue occurs when clinicians are overwhelmed with notifications and communications and become desensitized increasing the likelihood of missing a critical patient event or making an error. According to one study cited by The Journal of Nursing Administration in their report, Losing the Moment: Understanding Interruptions to Nurses’ Work, frequent interruptions were 1 of the 3 most cited causes for medication errors.¹

Communications represent hundreds of types of patient events inextricably linking them with the potential to contribute to interruption fatigue. A Clinical Communication and Collaboration (CC&C) platform is not simply a pass through for these events, but rather a sophisticated tool that manages the various components of a hospital’s communications infrastructure to deliver actionable notifications to the right clinician, and to facilitate communication with the patient and/or care team members at the right time.

Defining the Clinical Communication and Collaboration Market

Clinical Communication and Collaboration (CC&C) is a broad set of capabilities along the care continuum directed at clinicians to enhance care team effectiveness and patient experiences. CC&C is further defined in Gartner’s recently published Market Guide for Clinical Communication and Collaboration as the “convergence of legacy inpatient communication systems with nexus technologies such as cloud, information, mobile, and social.”² Collectively, these segments serve the larger goal of shifting from a volume to a value-based healthcare system. This means hospital reimbursements are now based in part on how effectively they care for patients.

Care team communications increasingly play an important role in delivering effective care as indicated by a recent case study at Saint Joseph Hospital that found nearly 65% of the alarms and alerts not initiated by the patient and/or physiological monitor involved the coordination of care between the nurse and other services.³

Similar in nature to the scenario highlighted above regarding the care coordination of mom and baby; all acute patient care requires the input from many team members including nurse, physician, aides, laboratory, radiology, social work, dietary, housekeeping, and many more departments.

Another aspect of the Saint Joseph study demonstrated that nurses are often interrupted by events that do not necessarily involve direct patient care, but rather interruptions from many other sources. With the use of the Vocera platform, the nurses were able to answer the notifications in their own time as patient care would allow, resulting in a 30% reduction in clinical interruptions.

Before the platform was implemented, 93% of clinical interruptions were triggered by non-emergent events. After the platform was in use by the care team, that number was reduced to 63.2%, resulting in a 30% decrease in nursing interruptions.

According to a 2014 HIMSS Analytics report, nearly 70% of clinicians now report using smartphones or tablets at work. The proliferation of mobile devices at the point of care has created demand for clinical solutions designed to address one or more CC&C segments.⁴

Gartner’s report outlines the future of the CC&C market and identifies vendor exemplars for hospitals vetting solutions.⁵
According to Gartner, CC&C systems improve care team communications and collaboration by enabling integration with applications and systems such as nurse call, alarms/alerts/notification platforms, patient throughput systems, location and condition-sensing technology, the electronic health record (EHR) and other clinical systems. Advanced integration "brings patient context and data to the point of care in a highly usable, secure, and scalable manner."

When asked to select contributing factors to patient care errors, nurses cited communication issues with physicians as one of the two most highly contributing factors, according to a report from the National Council of State Boards of Nursing.5

The Vocera platform fosters uninterrupted clinical surveillance between the diverse care providers. A clear example of this is the care team communication and care coordination between all involved in the mother/baby admission scenario above. Vocera's "one platform" approach is a logical extension of CC&C because it integrates and aggregates the data hospitals have already captured and infuses it into the communications paradigm.

Notably, Gartner emphasizes no one vendor has earned the title of the leader of the CC&C space because it is still being defined, and is so broad. However, we know with certainty that integration to other business and clinical systems is critical as well as a proven track record of successful deployments.

**Building A Strategic Foundation For Your CC&C Future**

According to The Joint Commission, communications are the number one cause of delays in treatment. A CC&C platform unites several market segments by integrating multiple clinical systems, medical devices, and mobile phones, and creating an interoperable network of data to provide necessary context and situational awareness to clinicians for actionable patient events.6 While the market for CC&C solutions is still evolving, there are some obvious necessities for improving care team effectiveness and the patient experience:

- Single Platform for Integration and Data Aggregation
- Alarm and Alert Management
- Patient-Centric Text Messaging
- Dynamic Care Team and Patient Context

**Single Platform for Integration and Data Aggregation:** Any viable enterprise system starts with a solid foundation. The platform must be designed to support clinical workflow (i.e., a workflow engine), comprehensive integration to many enterprise systems, data aggregation and storage, and be capable of delivering advanced rules processing features. Only then should a well-designed mobile care team application be layered on to take advantage of the underlying platform.

One pitfall to avoid is approaches that have started with a secure messaging app – because it is the easiest place to start – and then present the illusion that there is a comprehensive platform underlying that can handle all of the data and integration requirements. Often this leads to "forced partnering" situations whereby the secure messaging vendor requires a "middleware" partner to help deliver a complete solution. This approach is more complex and ultimately costs more in terms of having to manage multiple systems and vendors. And of course the data ends up being stored in separate systems making reporting and workflow analysis a real challenge.
Integration unlocks the data from EHRs, nurse call, RTLS, staff directory, and other clinical systems and applications that is necessary to drive all of the salient features of a care team communication system:

- Access to patient demographic data enables a system to be patient-centric
- Access to care team data enables dynamic care team rosters to be managed
- Access to alarm and event data enables time-critical notifications to clinicians
- Access to contextual data such as location data from RTLS and presence data enables real-time communications and a dynamic event response workflow

**Alarm and Alert Management:** All acute care environments rely on patient monitors and medical devices to track patient vital signs and to alarm a nurse when the patient is distressed. As a result of The Joint Commission’s National Patient Safety Goal in 2003 requiring these alarms be audible to prevent a missed sentinel event, many hospitals began dispatching them to mobile phones carried by nurses. These secondary alarm notifications require an FDA 510k clearance characteristic of an advanced CC&C platform.

Alarms were targeted again by The Joint Commission with a new National Patient Safety Goal that took effect January 1, 2016, but with a markedly different goal: to reduce the number of non-actionable clinical alarms. A decade ago, alarms were missed because they couldn’t be heard. Today, they’re missed because nurses are desensitized to the overwhelming number of false, nuisance, and otherwise non-actionable alarms constantly distracting and interrupting them. The new NPSG aims to reduce unnecessary alarms with better policies, training, and technology.

In addition to patient monitors, most acute care settings rely on nurse call alerts to notify a caregiver when a patient needs assistance ranging from a high priority code blue to a low priority bath assist. EHRs are another alert generating system that all hospitals have implemented in...
compliance with meaningful use initiatives. A recent KLAS report, Secure Messaging 2015: First Look at Who Providers Are Considering and Why, suggests these systems are the key integration point for a secure text messaging solution, which highlights the next CC&C segment: patient-centric texting messaging.7

**Patient-Centric Text Messaging:** There are dozens of secure text messaging solutions that have emerged to solve specific problems such as caregivers using personal mobile phones to text each other about patients in violation of HIPAA security guidelines, putting hospitals at risk of millions of dollars in potential fines. To address this singular issue, most standalone secure messaging solutions were designed for the primary purpose of enabling text messaging across a secure network, but they lack functional use for the acute care setting.

If a clinician is texting about a patient from a standalone app, they are transcribing the patient’s name, room number, bed number, and any other pertinent details, which opens up the possibility of human error and patient misidentification exponentially. There is also the time it takes to transcribe all of this information.

A CC&C platform delivers critical alarm and alert data in tandem with a secure messaging tool to ensure the care team is utilizing accurate information and communicating about the right patient. As reported by KLAS, patient monitors, nurse call and EHR systems provide a means for leveraging existing contextual data to facilitate patient-centric text messaging, but they were not designed to support dispersed virtual care teams, or to serve as the central hub for integrating enterprise alarms with secure messaging. A CC&C platform is required to intelligently unify these systems.

Gartner reports that secure texting is the salient feature of all CC&C platforms, but notes that secure texting vendors that cannot cross the chasm of including more CC&C capabilities won’t survive.

**Dynamic Care Team and Patient Context:** The primary benefit of a CC&C platform is the ability to leverage existing data from multiple systems to improve the value of notifications as well as the coordination of patient care. As the Gartner report concurs, CC&C systems must be able to create a directory of care team members to facilitate collaboration over various communication channels such as voice and text, and across multiple devices such as smartphones, tablets, and Wi-Fi handsets.

Dynamic care teams are generated with clinical context. Alarm context displays information about a specific notification to the recipient, e.g. a patient’s blood pressure, respiratory rate, and SpO2, while patient context supplements notifications with relevant ADT and EHR data about the patient, e.g. room number, admit reason, and primary care physician.

A dynamic care team roster leverages context to identify the most appropriate caregiver(s) for responding to a patient event. Care team members are capable of setting their own presence (available or not available), or it can automatically change based on RTLS/RFID integration (i.e. location information) when a clinician enters an “interruption-free” zone.

Dynamic care team and care team context refers to the part of the response workflow and resulting communications when the CC&C platform dynamically generates a list of available care team members based on the nature of the alarm eliminating the need to manually search through a large enterprise roster for an available caregiver with appropriate credentials.

Finally, cognitive load context may be derived through the Vocera Engage dynamic rules engine and its ability to accumulate the number and complexity of accepted tasks and assignments throughout a 12-hour shift, and determine the most appropriate clinician to allocate – or not allocate – an alarm to.

“Despite having fewer staff resources and more physical space to cover – response times have declined and patients report higher satisfaction as a result of automated notifications with Engage.”

**Jeff Zweifel**
RN, MedSurg Unit Manager at Clovis Community Medical Center
Each of these components provides a valuable service, but without a solid strategy for integrating them into a cohesive CC&C plan, hospital IT departments will continue to piece together solutions resulting in an “accidental architecture” and nurses will continue to experience cognitive overload and interruption fatigue. Patient safety risks can be reduced with the appropriate tools and clinical expertise.

Identifying the Most Comprehensive CC&C Platform

In addition to Gartner’s endorsement as an alarm and alert management vendor exemplar, KLAS also cited Extension Healthcare (now Vocera Communications, Inc.) as a strategic vendor in its recent report on secure messaging vendors. The report notes that the company’s strengths in these areas along with its FDA 510k clearance make it one of the most comprehensive CC&C platforms available today.

With what is traditionally accomplished using several vendors and platforms (i.e. accidental architectures), the Vocera platform combines comprehensive alarm management with secure communications on a single platform. Designed for enabling situational awareness and timely information sharing across care teams inside and outside the hospital, the system aggregates alarm, patient, and care team data from a variety of systems including physiological monitors, nurse call and lab systems, Electronic Health Records (EHR), and location sensing technologies, and relays relevant information to enhance the usefulness of alarm and alert notifications. Leveraging the common platform that is purpose-built for extensive integration and data aggregation, Vocera’s secure texting solution helps to expedite care coordination in response to events. With proven integrations and interoperability in many hospitals including some of the nation’s largest healthcare systems, the Vocera system has become a preferred solution for improving care quality and patient and caregiver experiences.
References


*Extension Healthcare was acquired by Vocera Communications, Inc. shortly after the Gartner report was published.*