BEYOND THE EHR: How to seamlessly connect Nurses and Physicians using an EHR-Extender (EHR-e)

Clinical Alerting and Text Messaging: How EHR-Extenders bring improved care, enhanced workflow, and better communication to healthcare organizations - and a smile to the faces of patients, nurses, doctors and regulators

When a hospitalized patient experiences symptoms of an acute myocardial infarction (AMI) or heart attack, the emergency department physician will order a panel of three cardiac specific enzyme tests referred to as "Cardiac Triple Markers." Although these tests may initially present as negative, the patient typically will not experience an elevation of enzyme levels until six hours after the onset of chest pain and other AMI related symptoms.

Therefore, clinicians need access to the panel of test results — and then need to again check enzyme levels six hours later and eight to 12 hours after the patient first exhibited symptoms. To make treatment decisions, the physician needs to check these levels in context. That is, the doctor doesn't just need to know the absolute levels but also need to know if the levels are trending up. If the Cardiac Triple Marker enzyme levels are elevating, appropriate measures need to quickly be taken to save the patient's life, preserve the patient's cardio-pulmonary health and save other vital organs that the heart affects. At this time, a whole team of caregivers including the physician, charge nurse, primary nurse and registration supervisor need to be called to action.

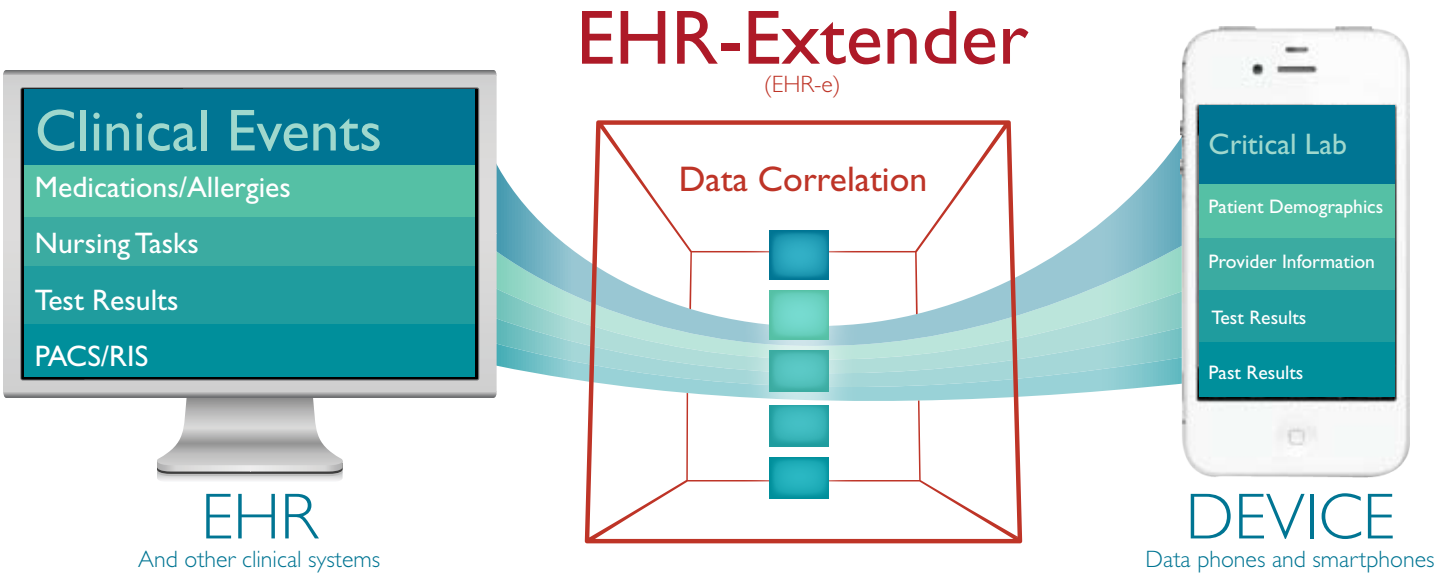
In the typical scenario, however, action is sometimes delayed — not for a lack of trying — but due to an in-grained culture and system that breeds highly staggered, disconnected communication.

What's needed is an EHR-Extender that expands the value of the original EHR by providing essential features and functionality that clinical end-users truly need. The beauty of EHR-Extenders lies in the fact that these solutions help providers meet emerging or changing needs by inexpensively adding functionality to their existing EHR investments, eliminating the need to start over from scratch.

For example, when the doctor receives the lab results, he will try to get in contact with the nurse on the hospital floor who is responsible for caring for this patient. The doctor will call the unit clerk — who in turn will page the nurse. The nurse might be in the middle of another crucial patient care event when she hears the page. As a result, the nurse might not return the call for several minutes. When the nurse finally reaches the doctor, he will ask her to consult the paper chart or electronic health record (EHR) to see if the patient's enzyme levels are trending upward. More minutes elapse. Finally, the nurse gets the information to the doctor — and a treatment decision can be made. Unfortunately, if significant amounts of time elapsed, it could be too late and the treatment might not be enough to save the patient, despite the fact that everyone involved did their best to get the proper care to the patient.

What's needed is an EHR-Extender (EHR-e) that expands the value of the original EHR by providing essential features and functionality that clinical end-users truly need. The beauty of EHR-Extenders lies in the fact that these solutions help providers meet emerging or changing needs by inexpensively adding functionality to their existing EHR investments, eliminating the need to start over from scratch.

In this scenario, the EHR-e could offer closed-loop, context-aware clinical alerting and texting. With an EHR-e in place, the nurse and doctor (as well as other caregivers tied to the patient) would receive a message as soon as the lab results were ready. But the alert would not only communicate the lab results, it would also be wrapped with information from other clinical and administrative databases, thus supplying the clinicians with relevant "context." In this particular case, the message would also include information about the patient's trending enzyme levels. The likely end-result: There would be little decision-making lag time — and the doctor could quickly initiate the treatment that could save this patient's life.



Consider the following:
A 500-bed hospital loses more than $4 million annually as a result of communication inefficiencies.

Certainly, providing care in an environment that utilizes closed-loop, context-aware clinical alerting and texting has the potential to make patients much happier as they receive the prompt service that can save their life, ease their pain, make them more comfortable and simply make them feel like they matter. But context-aware clinical alerting and texting does not only bring a smile to patients. A look at the power of this new paradigm of communication illustrates why it can result in the improved communication, enhanced workflow and better clinical care that makes caregivers, administrators and regulators happy as well.

Defining a new communication model

Although healthcare organizations have been vying to improve communication among caregivers and from clinicians to patients by adopting various automated tools, very few providers have latched onto the electronic silver bullet. As a paradigm-shifting model of communication, context-aware clinical alerting and texting delivered via an EHR-e brings the following advantages:

"It's disconcerting for patients to hear code blues in the middle of the night. With a texting system in place, patients don't hear all this and they can truly get some rest."

—Paul Peabody, CIO at Palomar Health

Efficiency gained through electronic alerting and messaging. Clinical alerting and text messaging helps to alleviate the inherent hassle associated with trying to connect via phone in real time, an especially frustrating task for doctors and nurses who are typically on-the-go or engaged in activities that preclude taking phone calls. Consider the following: A 500-bed hospital loses more than $4 million annually as a result of communication inefficiencies.[1]

Intelligence culled from context. Clinical alerts delivered via text are good, but not good enough. If alerts can be delivered with the informational context pulled from databases such as the admission-discharge-transfer (ADT), electronic health record (EHR), laboratory (LIS), radiology (RIS), or pharmacy system (Rx), then the receiving clinicians gain greater insight into the relevance of the alert.

Effectiveness gained through definitive workflow resolution. To truly have a positive impact, though, the alerts cannot simply be released into the stratosphere. Instead, the entire care team needs to know if the alert produced the requisite action. For example, if a patient has requested ice chips, the delivery of the ice chips needs to be noted. As such, the communication system can continually provide an escalating series of alerts, ensuring that proper action is ultimately taken — instead of merely delivering assorted messages.

Positive impact on patients

Closed-loop, context-aware clinical alerting and texting potentially can have a variety of positive impacts on patients. Most importantly, the improved communication among caregivers is likely to result in enhanced care. Indeed, miscommunication among clinicians is a huge industry problem — as 62% of accidental deaths and serious injuries as well as 80% of serious medical errors are caused by communication failures, according to the Joint Commission.[2]

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In one case at a Texas hospital, a serum sodium level of 124 was returned by the lab, but the nurses did not communicate it to the physicians. Similarly, a second sodium lab value came back at 121, and no physician was notified. As a result, there was a delay in treatment and the patient developed a permanent, severely disabling brain injury. If the hospital had used a closed-loop, context-aware clinical alerting and texting system, all members of the care team most likely would have received the lab results in a timely manner, and the required intervention probably would have occurred.

The failure to communicate lab results is an especially egregious problem that plagues many healthcare organizations — and can result in serious harm. Consider the following example: Post-neurosurgical or head trauma patients are at risk to develop hyponatremia, a serious life-threatening condition. In such patients, serum sodium levels must be closely monitored — and if they drop below 135 milliequivalent per liter, nurses must immediately communicate this to physicians. In one case at a Texas hospital, a serum sodium level of 124 was returned by the lab, but the nurses did not communicate it to the physicians. Similarly, a second sodium lab value came back at 121, and no physician was notified. As a result, there was a delay in treatment and the patient developed a permanent, severely disabling brain injury.[3] If the hospital had used a closed-loop, context-aware clinical alerting and texting system, all members of the care team most likely would have received the lab results in a timely manner, and the required intervention probably would have occurred.

In addition to improving clinical care, however, such EHR-e solutions can enhance the patient experience in other ways as well. Simply meeting needs in an efficient manner helps patients feel better about their hospital stay, according to Paul Peabody, CIO at Palomar Health, a four hospital California-based public health system that has been leveraging a closed-loop, context aware clinical alerting and texting system at its new 288-bed Palomar Medical Center in Escondido, Calif., since late summer 2012.

“We have heard from patients. They are really happy. They like the quick response they are getting when they hit the call button,” Peabody says. “Someone is paying attention to them. And, that is what we wanted to do here at Palomar. We really want to be more patient focused.”

In addition to receiving prompt attention, patients also benefit from the reduced noise — as the system radically cuts down on the number of loud overhead pages.

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Keeping patients happy is apt to help hospitals improve patient satisfaction and improve Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores. In addition, improved patient satisfaction will help providers maximize reimbursement under pay-for-performance models that are designed to reward providers based on patient satisfaction as well as care outcomes.

Positive impact on clinicians

Closed-loop, context-aware clinical alerting and texting does not only make patients happier, it helps to improve clinician satisfaction as well. Most importantly, context-aware clinical alerting and texting helps clinical staff members work more efficiently.

To start, these EHR-Extenders help caregivers better cope with their difficult-to-manage "interruption driven" workflow. In hospitals, most caregivers continually respond to happenings, instead of following a plan, to get through the day. As such, various tasks can get lost in the shuffle — as work starts and stops. With context-aware clinical alerting and texting, a workflow engine can ensure that vital tasks are completed and can accumulate useful context that helps to direct clinicians to make the best choices as their workday evolves.

What's more, these EHR-e solutions help to significantly streamline workflow. A simple example: A patient requests something to eat. In the typical scenario, the nurse would have to walk into the patient room and check the chart to ensure that the patient is not requesting something that is at odds with his medication or condition — and then the nurse would need to comply with the request or offer the patient an alternative. With context-aware clinical alerting and texting, the nurse would receive the request via text, along with pre-determined specified information culled from any one of a variety of systems including Rx, EHR, LIS, RIS and others. So, she would know if the request was acceptable and would not have to take an extra chart-checking step.

Economic Burden of Wasted Nurse Communication Time in Hospitals

Number of Nurses in the US	2,542,760
Average hourly rate	35.22
Percentage employed in hospitals	59%
Time spent communication per shift	75 minutes
Estimated waste - % of communication time	50%
Number of minutes wasted per shift	37.5
Dollars wasted per shift	$22.01
Dollars wasted per nurse annually	$3,302.23
Dollars wasted for nurses employed in hospitals annually	$4,954,094,072

Source: Journal of Healthcare Management 55:4 July/August 2010

More complex workflows, of course, result in even greater streamlining. For instance, using context-aware clinical alerting and texting in the emergency department helped one hospital streamline workflow considerably. Before adopting the system, workers typically walked through 72 separate steps from the time a patient came through the ED doors until the patient was placed in a bed in the ED's boarding area. After implementing context-aware clinical alerting and texting, however, the hospital was able to streamline the process to include just 24 steps.

Such streamlining does not just improve clinician satisfaction, it also helps improve efficiency — and, therefore, reduce overall costs. Indeed, nurses typically spend 75 minutes communicating per shift. Half of that time, however, is wasted due to inefficiencies (see table).

Clinically contextual communication also streamlines communication among various caregivers within a hospital, most notably making it easier for nurses and doctors to connect. Nurses frequently need to contact doctors outside of the hospital to consult about patient care. And, the inefficiency associated with the phone tag is frequently cited as a frustration and time-waster for all involved.

Closed-loop, context-aware clinical alerting and texting also helps assuage the transition to EHRs and computerized physician order entry. With CPOE, physicians enter their own orders into electronic systems. As such, nurses can no longer depend on picking up paper orders at the nursing station but must manually check the EHR at frequent intervals to check for new orders. With context-aware clinical alerting and texting, however, these orders can be pushed directly to the nurse's mobile device.

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Best of all, perhaps, clinicians are apt to adopt context-aware clinical alerting and texting, because they can utilize whatever device they choose — from corporate-issued WiFi phones to smartphones and even wearable communication badges.

Satisfying regulatory requirements

Although the main benefits of closed-loop, context-aware clinical alerting and texting are realized in improved care and enhanced patient and employee satisfaction, these EHR-e solutions simultaneously can help organizations more successfully comply with industry rules — making both administrators and regulators happy. Indeed, such solutions can help organizations comply with:

Patient privacy rules under HIPAA. Under HIPAA, clinicians are only allowed to electronically exchange protected health information in a secure manner. However, as the industry — and culture in general — has become more automated, many clinicians are exchanging information via personal smartphones or other devices. While most healthcare organizations have strict policies forbidding this practice, nurses and doctors who face difficult and cumbersome communication challenges are apt to ignore the policies and are likely to use text messaging regardless.

By offering closed-loop, context aware clinical alerting and texting to clinicians, administrators can avert this potential problem. With such a system in place, messages are displayed via the web behind a password-protected firewall. Messages are stored for a specific time period as governed by the organization's data retention policies. As such, data is never stored on the device, thereby ensuring compliance with HIPAA and Joint Commission guidelines. The communication system requires user authentication and is PIN protected. The system, however, can be configured to grant certain privileges based on defined user roles.

Meaningful Use required to receive incentive funds under the American Recovery and Reinvestment Act. As the government's EHR incentive program continues to evolve, more emphasis is being placed on the integration of information from various systems. Closed-loop, context-aware clinical alerting and texting brings together data from various systems under a clinical context. In addition, EHR-Extenders help clinicians use this information where it matters most and where it is most convenient — at the mobile point of care. Indeed, EHR-e solutions could help providers meet Stage 2 interoperability requirements and other evolving meaningful use requirements by offering providers a way to cost-effectively add on to their initial EHR investments.

Patient safety stipulations promulgated by the Joint Commission. Perhaps most importantly, context aware clinical alerting and texting helps organizations comply with many directives emanating from the Joint Commission. For example, context aware clinical alerting and texting helps providers comply with the accrediting organization's National Patient Safety Goals mandate that that critical test results are delivered in a timely manner to a responsible licensed caregiver.

Offering such functionality via an EHR-e provides a cost-effective means to continuously innovate and, thereby, provide exactly what's needed to drive more efficient workflows and improve patient care in a constantly changing environment.

The Joint Commission, however, does not merely require that results be delivered — but that these results are also formally acknowledged. The requirements specify that the person receiving the result has to verify or read back the complete order or test result.[4] As such, healthcare organizations need to ensure that electronic lab result notifications don't merely float in the stratosphere. Therefore, healthcare organizations cannot just implement messaging systems but must ensure that these systems provide the closed-loop functionality to comply with the accrediting organization's requirements.

At Tanner, for example, nurses automatically receive critical lab values on their Cisco handsets while physicians automatically receive notifications on their iPhones or Android smartphones. These clinicians also have the ability to easily acknowledge the receipt of the alerts. As such, the hospital will comply with Joint Commission measures.

Such closed-loop functionality weighed heavily on leaders at Tanner Health System, Carrollton, Ga., when the organization was seeking to implement an improved communications platform.

"We had identified the need for better communication between our providers, but we didn't want to provide electronic communication without the closed-loop reporting feature," says Walter Reid, M.D., information system advisor for medical systems at Tanner. "We needed to be able to document that a physician acknowledged the receipt of a critical result. We needed that closed loop functionality."

Communication in highly mobile healthcare environments has always been a challenge. The fact that miscommunication is now identified as a source of substandard care is prompting many healthcare organizations to investigate new innovative communication models. Closed-loop, context-aware clinical alerting and texting offers the clinically relevant information that clinicians need to improve care delivery. With such systems in place, organizations can provide the care and service that increases patient and clinician satisfaction — while also enabling providers to more expediently comply with a variety of organizational policies and industry regulations. Offering such functionality via an EHR-e provides a cost-effective means to continuously innovate and, thereby, provide exactly what's needed to drive more efficient workflows and improve patient care in a constantly changing environment.

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