INTEGRATED VS. INTERFACED

Considerations for Emergency Department Systems

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THE OVERVIEW

Healthcare organizations have a vested interest in creating an infrastructure that delivers integrated patient information. Not only is the outcome of care improved when clinicians have complete, usable data, but additional benefits are immediately realized. These benefits include: improved operational efficiency, compliance with regulatory requirements, capabilities for measuring and managing quality of care and participating in research, reduced number of IT systems requiring implementation and support, and much more.

Different departments and specialties within hospitals sometimes want niche information systems that address their particular needs. By the very nature of disparate systems, information transfer is challenging. With the purchase of stand-alone modules, hospitals have been forced to settle for basic, limited levels of integration for their clinical information. Stand-alone IT systems create a reality in which medical records are scattered in various locations and formats. The task of assembling all discrete portions of data into one cohesive "patient record" can be daunting, if not practically impossible. Consequently, many patient care encounters take place without all relevant medical information, thus impairing adherence to quality and reporting initiatives. It is indisputable that an integrated view of a patient’s history provides value to clinicians.

A longitudinal view of a patient’s conditions and tests, medications, sensitivities, and more enables clinicians to be more effective in both diagnosis and care. This is possible with an integrated hospital information system (HIS), which also sets the foundation for true interoperability that enables further interpretation and understanding of the data.

Niche vendors will claim that these advantages can be captured with interfaces between the systems, but this has simply not been proven true. Major HIS vendors (i.e. Epic, MEDITECH, etc.), on the other hand, provide one system that moves from the ambulatory world to the inpatient world. Placing an interfaced system between physician practices and hospitals removes many
of the values of a single integrated system and generates another level of complexity not just from the emergency department (ED) to the inpatient facility, but also from the ambulatory facility to the ED.

There is no area where “integrated vs. niche system” is a bigger issue than in the emergency department. The ED is usually the fastest-paced area within the organization and the “front door” to the hospital, as a majority of admissions flow through the ED. Billing requirements, order capture speed, and workload volume are driving forces that can often increase the desire for a niche vendor. In years past, niche vendors were significantly ahead of ED modules as part of an integrated system, thus the argument was even more difficult. However, ED modules in more current releases are more powerful and have significantly closed the feature/function gap with the niche vendors, thus increasing the use of ED modules within an integrated solution.

### Integrated HIS

- Single user interface
- Lower cost
- Simplified workflows and upgrades
- Streamlined medication management and ordering process
- Single security setup
- Ease of capturing legal record

### Niche ED System

- Users move from one system to another
- Complicated interfaces to build and maintain
- Challenges with merged reporting
- Training challenges
- Future development concerns (as a result of fewer new sales)

Lastly, Meaningful Use, population management, and other quality reporting programs create significant reporting needs that are difficult to manage in an interfaced environment. There is an increasing need to have one source of truth for data that is immediate and accurate. Again, meeting these needs in an environment where much of the detail regarding a patient’s care is stored in separate systems can be overwhelming.
While a stand-alone application might work well for an individual department, connecting the modules to each other can be troublesome. The answer is often to develop multiple interfaces. Each of these interfaces introduces a break point and must be continuously monitored to ensure that data is crossing as intended.

Niche software applications typically involve high-end purchase prices or lease costs, plus the additional expenses necessary to modify and integrate the original product. In a virtual process flow of an emergency department, there are several “points” where the emergency department information system interacts with the hospital-wide system, ranging from the retrieval of administrative information to the interchange of clinical data.

In the past, data sent back and forth between modules was “transactional” data, such as patient demographics, charges, orders, and results. The use of this data was simple and straightforward. Clinical documentation was still being completed on paper. With clinical documentation, integration becomes more essential, more complicated, and much more difficult to achieve between the HIS being used throughout the rest of the facility and a stand-alone ED system. Typically, an ED vendor will send a “text file” to the HIS clinical data repository. That text file can be accessed and read, but clinical data elements captured, such as medical history, medication reconciliation, medication administration, clinical assessments, and physician and nursing notes cannot be integrated as structured discrete data, pulled forward as an integral part of the patient record in other departments, or used for clinical decision support. Vendors will often claim they can interface this data, but the reality of this integration has proved to be daunting, if not impossible. In order for this data to be utilized as discrete data in the rest of the facility, it has to be re-entered into the HIS, thus duplicating efforts, decreasing patient safety, and minimizing the impact of clinical data collection at a main patient entry point in the hospital.

Other points to consider when deciding between a stand-alone ED system and an ED module in the HIS include, but are not limited to:

- Coding vocabulary, lexicons, patient identifiers, and data structures that are neither uniform nor standardized pose obstacles for successful information transfer.

- An independent ED system would require interfaces for patient demographics, insurance information, coding/charge services, orders, documentation, results, and more for the department that is the single largest source of admissions to the hospital. Interfaces add a point of failure and unnecessary vulnerability relative to clinical and financial data transmission. They also may prevent or increase the risk of automation of clinical and financial rules and alerts that are becoming a common expectation for patient safety and compliance (i.e. therapeutic substitution, faster sepsis identification, etc.).

- Upgrades for a patient care system are troublesome, as they normally require significant testing and downtime. Each time a system is upgraded, the organization is forced to spend time, money, and effort ensuring any systems that are interfaced with the application will still work as before. Often the existence of an interface limits the primary HIS system and core applications are “dumbed down” to keep from breaking the interfaces with niche applications. The more systems that are in place, the more down time must be experienced each time one of the applications requires upgrades fixes. While most HIS vendors include upgrades at no additional cost for the software, niche vendors typically charge for such upgrades, and there are normally charges on both sides for interface changes. This is an underappreciated problem that can sound like a minor headache, but in reality is quite troublesome.

- Emergency departments typically account for 35-75 percent of hospital admissions, driving a significant amount of clinical documentation and revenue for the hospital. Better coding, billing, and documentation data and supporting processes improve hospital and physician patient care quality and collections. CMS and HOPPS/APC Emergency Department billing requirements are complex and data-intensive; attempting to interface clinical documentation and coding/charge data, much less setup rules, to increase safety/efficiency in this space is complex and risk-intensive. Without a doubt, the clinical documentation and patient accounting processes are better supported by an integrated solution rather than an interfaced one.
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- Medication management is one of the most difficult issues to manage for any patient/caregiver. Inputting home meds manually into a system and then modifying on departure and through all the transitions of care can be daunting. Though this process will never be without challenges, a true integrated system provides hope for improving this important aspect of patient care. With medications captured and tracked in the ambulatory system, an integrated ED will start with much more accurate data. Then, for those patients in the ED that are admitted to the hospital, the hand-off communication and transition of care for the medication history/management is seamless and automated instead of a combination of automation and paper. This integration is very difficult even within an integrated system, but almost impossible to manage with interfaces.

- With interfaces, Meaningful Use reporting would be completed out of two systems which creates complexity with data capture and aggregation for the Centers for Medicare and Medicaid Services (CMS) requirements. The certification process for an interfaced environment has been challenging for organizations, but future requirements seem even more difficult. Using an interfaced ED system has caused some organizations to limit their options under the Meaningful Use program to inpatient/observation patients, while those with an integrated system have more easily included ED patients.

- State-specific reporting and initiatives would also need to be completed out of two systems if you were to choose interfaced modules. This would require engaging additional resources to create reports or collect data, and the data would need to be manually correlated to the patient’s emergency record and inpatient record.

- Patient registration and ADT updates occur in the main HIS, so if a stand-alone ED system is used, this data would need to be interfaced. From a staff perspective, this generally complicates the patient presentation and triage workflows, as well as demographic update processes. Registration staff typically have to move between two systems throughout the encounter.

- If an ED module of the hospital’s HIS system is used, the charting/assessment process for both nurses and physicians can begin in the emergency department and continue seamlessly through completion in the respective inpatient areas, and even all the way through to discharge and potential readmissions. To emergency department staff, this advantage for the HIS system isn't necessarily “felt locally” until the patient returns to the ED for future visits. An integrated system allows prior historical documentation to flow from visit to visit, including prior ED physician and nursing documentation. Having medical history, home medications, vaccinations and other pertinent information flow seamlessly to the current visit from a past visit increases not only patient safety and satisfaction, but also nursing and physician satisfaction by saving them time. In addition, for inpatient nurses and physicians, the ability to easily "pick-up" where the emergency department process/documents left off in the same system is significant to both workflow and quality.

- From a technical standpoint, utilizing a foreign ED system would require most end user devices to be configured to access multiple systems. Separate hardware (network and application servers) would be a requirement resulting in higher upfront costs and greater complexity at the device and infrastructure levels. This negatively impacts the resource requirement surrounding network engineering and PC/mobile device support.

- Training is more straightforward with an extension of the current system versus a completely new system that has its own metaphors and processes, particularly for staff from other areas of the health system that float or provide services in the ED setting (such as nursing staff, technicians, case managers, ancillary staff, physicians, or consulting physicians).

- The potential integration with an ambulatory system is nonexistent with a niche vendor. A large integrated system offers organizations one seamless record from ambulatory to inpatient and beyond. Placing a third party non-integrated system in the middle of this flow removes many of the advantages of such integration.

- More systems lead to higher capital and ongoing operating costs, as well as complicated security administration for HIS end users.

- If an independent ED system is used it will likely lead to increased FTE requirements to manage a completely independent and comprehensive database architecture and applications.
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**RECOMMENDATION**

Santa Rosa strongly recommends using an integrated system, as its advantages far outweigh the feature functionalities provided by a niche vendor. Also, note that vendors, especially MEDITECH Expanse, have closed the gap so significantly that finding support for an interfaced solution is difficult.

In summary, the primary reasons for this integration include:

1. **There are increased reporting demands to meet regulatory requirements and proactively drive quality.**
2. **Population management is far more effective when fewer systems/databases are involved to track patient care.** The ED is such a crucial piece in both patient care and the cost of the system that having this portion separate creates numerous challenges.
3. **Modern systems are created to share data and tools.** Capturing all data in a single system and utilizing common tools for orders and documentation are crucial to its success.

Santa Rosa clients who made the decision to use an integrated EHR found significant improvements in several areas throughout their hospitals as a result of implementing an integrated EHR, including:

- Better communication between providers and nurses during patient care activities. Nurses did not have to utilize paper printouts of orders entered through a separate system to facilitate patient care.
- Consistent integration with essential technologies utilized throughout the hospital. Many types of technology cannot integrate with more than one EHR at a time; having one EHR allowed hospitals to take advantage of integration with Omnicell, Philips monitors, etc.
- The patient medical record is a complete reflection of the visit from start to finish. The medical record no longer resides in multiple systems, so inpatient providers can view all of the information they need in one place and do not need to remember multiple sign-ons and passwords.
- Patient safety increased as a result of having one complete record. With an integrated EHR, providers were able to see patient medical history, interventions that were executed in the emergency department, orders entered and completed, and orders that were still active. This was found to be particularly impactful for hanging IV medication orders, or blood products that had been started, but not completed, in the emergency department.
- Providers completing documentation, such as a progress note on their patients, were able to take advantage of integrated EHR technology. This allowed them to pull in data from other areas of the system. For example, a provider could pull the results of a CBC lab test into a progress note to support care decisions for a patient.
- Medication reconciliation processes were completed properly with a significant reduction in errors due to transcribing from the niche ED system to the inpatient EHR. All medication orders became closed-loop orders and were integrated into the medication reconciliation process.
- There has been a reduction in costs associated with EHR systems due to phasing out disparate systems and sun-setting interfaces.